

ATCA-7367 RHEL 5.6

User Guide

P/N: 6806800M98B

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About this Manual

Overview of Contents

This manual is intended for users interested in RHEL installation, hypervisor installation, and Utilities Package (UP) support on ATCA-7367. It is assumed that user has basic understanding of Linux/Unix, Networking, AdvancedTCA® , and telecommunications.

It is divided into the following chapters and appendix:

- [Introduction on page 13](#), gives an overview about ATCA-7367.
- [Installation of RHEL Server Edition on page 17](#), describes the installation of RHEL Server Edition on ATCA-7367.
- [Hypervisor Support on page 79](#), describes about hypervisor and its installation.
- [Utilities Package on page 89](#), describes the Utilities Package (UP).
- [Related Documentation on page 171](#), lists all the related documents.

Abbreviations

This document uses the following abbreviations:

Abbreviation	Definition
AMC	Advanced Mezzanine Card
ATCA	Advanced Telecommunications Computing Architecture
BBS	Basic Blade Service
BCM	Board Control Module
BIOS	Basic Input/Output System
BSD	Berkeley Software Distribution
UP	Utilities Package
CD	Compact Disc
DHCP	Dynamic Host Configuration Protocol
DVD	Digital Versatile Disc
FCU	Firmware Upgrade Command-line Utility
FPGA	Field Programmable Gate Array

Abbreviation	Definition
FRI	Firmware Recovery Image
FTP	File Transfer Protocol
FUF	Firmware Upgrade Facility
HPM	Hardware Platform Management
HTTP	Hyper Text Transfer Protocol
I/O	Input /output
IPMC	Intelligent Platform Management Controller
KVM	Kernel Based Virtual Machine
LUN	Logical Unit Number
MMC	Module Management Controller
NFS	Network File System
PCI	Peripheral Component Interconnect
PICMG	PCI Industrial Computer Manufactures Groups
PXE	Preboot Execution Environment
RAID	Redundant Array of Independent Disks
RHEL	Red Hat Enterprise Linux
RTM	Rear Transmission Module
TFTP	Trivial File Transfer Protocol
UP	Utilities Package
VNC	Virtual Network Computing

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
Screen	Used for on-screen output and code related elements or commands in body text
Courier + Bold	Used to characterize user input and to separate it from system output
<i>Reference</i>	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12
.	Omission of information from example/command that is not necessary at the time being
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)
	Logical OR

Notation	Description
WARNING XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
CAUTION XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
NOTICE XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Indicates a property damage message
	No danger encountered. Pay attention to important information

Summary of Changes

This manual has been revised and replaces all prior editions.

Part Number	Publication Date	Description
6806800M98A	September 2011	First edition
6806800M98B	August 2014	Re-branded to Artesyn

Introduction

1.1 Overview

The ATCA-7367 is a high performance single processor AdvancedTCA server blade and ATCA node board, designed according to *PICMG 3.0 Revision 3.0 ATCA Base Specification*. ATCA-7367 is a single board computer that offers a powerful processing complex through a single six-core Intel Westmere-EP processor, and supports up to 48GB DDR3 memory. Furthermore ATCA-7367 provides local storage (Onboard SATA disk/SATA Cube, onboard flash disk, or through the RTM), standard I/O and redundant Gigabit Ethernet connections to the back plane's Base Interfaces (PICMG3.0) and Fabric Interfaces (PICMG 3.1 Option 1, 9). Another important feature is that ATCA-7367 provides AMC support and is compatible with different AMC boards to meet the application-specific requirements. The ATCA-7367 provides system management capabilities and is hot swap compatible based on the ATCA specification.

The following lists the main features of ATCA-7367:

- Form factor: Single slot ATCA (280mm x 322mm)
- Processor: Intel Westmere-EP Six-Core processor (Intel XEON 5600 series), Drop-in compatible with Intel Nehalem-EP processor (Intel XEON 5500 Series)
- North Bridge: Xeon 5520 (Tylersburg IOH36 D)
 - Provides two QPI interfaces for connecting to up to two Intel Xeon processors
 - Provides 36 PCI-e Gen2 lanes, Intel Virtualization Technology, ESI interface and Management Engine
 - FC-BGA 37.5mm x 37.5 mm, 1295 balls
- South Bridge: ICH10R, ESI connection to Xeon 5520 (Tylersburg IOH36 D)
 - Provides extensive I/O support and Boot path to redundant SPI Boot flashes
 - I/O interfaces include SATA, USB2.0, LAN, LPC interface, RTC with WDT
- Base interface : Dual 10/100/1000Base-T Ethernet
- Fabric Interface: Dual 1G/10Gbps Ethernet interfaces, support PICMG3.1 option 1 and 9
- Update Channel: One 10/100/1000Base-T, and SAS ports
- RTM Interface
 - Five PCI-e x4
 - 8-Port AMC I/O

- 2x SAS Ports (SAS controller is on RTM)
 - 1x SATA port
 - 3x Telecom Clock
 - 1x UART and 1x USB interfaces
 - IPMI Management bus
- One AMC slot
 - GE on ports 0, 1, 8, 9, 10, 11
 - PCIe x4 on ports 4-7
 - SAS on port 2, SATA on port3
 - Port 13-20 to Zone 3
 - TCLK and FCLK support
- Front Panel
 - One 10/100/1000BASE-T Ethernet
 - Two USB2.0 Ports
 - One serial console
- BIOS Chip: Up to 1 MB onboard Boot and 1 MB Recovery Boot Flash (SPI)
- Onboard storage support
 - 2.5 Inch SATA HDD
 - SATA Cube (SSD): 16, 32, 64, 128 GB capacity
 - USB flash (EUSB SDD), 1, 2 or 4 GB capacity
- Onboard IPMC (IPMI management controller) implements IPMI version 1.5
- Onboard Glue Logic FPGA for IPMC extension and onboard control register

The ATCA-7367 supports:

- RHEL 5 update 6 (and further updates) Server Edition
- Xen and KVM Hypervisor on RHEL 5 update 6 (and further updates) Server Edition

For more information on ATCA-7367, refer <http://www.artesyn.com/computing/>



Throughout this manual, RHEL 5 refers to 32 bit and 64 bit version of RHEL 5.

Installation of RHEL Server Edition

2.1 Overview

The ATCA-7367 supports RHEL 5 update 6 (and further updates) Server Edition operating system.

This chapter describes the installation of RHEL 5 update 6 Server Edition and the same procedure can be followed for installing further updates of RHEL 5. For specific instructions on installation, refer http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/index.html

Installation of RHEL 5 update 6 Server Edition over serial console or VNC can be done using following methods:

- CDs/DVD
- PXE Network-Based Installation



The ATCA-7367 supports RHEL text mode installation over serial console, and graphical mode installation using VNC.

2.2 RHEL 5 Update 6 Server Edition Installation using CDs or DVD

The following sections describe the RHEL installation in text mode and graphical mode using CDs or DVD.

2.2.1 Prerequisites

You should have the following software and peripherals before starting installation:

- Installation CDs or DVDs of RHEL 5 update 6 Server Edition
- USB CD-ROM for installation using CDs of RHEL, or USB DVD-ROM for installation using DVD of RHEL
- VNC viewer, if you want to do installation in graphical mode



To install 32 bit operating system, use x86 CDs or DVD of RHEL and for 64 bit operating system use x86_64 CDs or DVD of RHEL.

2.2.2 Installation Setup

This section explains the procedure required to create installation setup for installation using CDs/DVD.

Procedure

1. Connect serial console cable to front panel of the blade and access serial console using the following settings.
 - baud rate: 9600
 - data bits: 8
 - parity: none
 - stop bit: 1
 - hardware control: none
2. Connect USB CD-ROM or DVD-ROM to any USB port of the blade or RTM-ATCA-7360 .

3. Reset the blade using shelf manager or reset button provided at front panel of blade. When blade boots up after reset, the following output is displayed.

```
Emerson ATCA-7367 BIOS Version 1.0.3 (07/13/2010 - 09:26:42)

Board-Info:
  FPGA version: 04
  CPLD version: 2
  Reset Cause: CPU
  BIOS Boot Mode: Normal
  Boot Flash Selection: Bank B (IPMI)
  Flash Bank A: WP off
  Flash Bank B: WP off
  IPMC Version: 2.0.0.000000008
  ATCA Power Level 2: 152.0 Watt - No Power Limit
```

4. When the following screenshot is displayed, press **<F2>** or **<Del>** key to enter into **BIOS** menu to set CD-ROM as first boot device and hard disk as second boot device.

```
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.
Press <DEL> or <F2> to enter setup.
```

When **<F2>** or **<Del>** key is pressed, BIOS window is displayed on serial console.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| BIOS Information                                     | Set the Date. Use Tab to | |
| Board Name      Emerson ATCA-7367                  | switch between Data     |
| BIOS Version    1.0.3                              | elements.               |
| Build Date     07/13/2010 09:26:42                 |                          |
| Board Information                                     |                          |
| Current System  Standard                           |                          |
| FPGA Version    4                                   |                          |
| Boot Flash Selection Bank B (IPMI)                  |                          |
| Memory Information                                     |                          |
| Total Memory    8192 MB (DDR3)                     |                          |
| System Date     [Wed 09/08/2010]                   | |>: Select Screen       |
| System Time     [10:56:20]                          | ^v: Select Item        |
| Access Level    Administrator                       | Enter: Select          |
|                                     | +/-: Change Opt.       |
|                                     | F1: General Help       |
|                                     | F2: Previous Values    |
|                                     | F3: Optimized Defaults  |
|                                     | F4: Save  ESC: Exit    |
|                                     |                          |
|                                     6:08              |                          |
|-----|
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

5. Select **Boot** menu using left or right arrow keys.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
/-----+-----
| Spread Spectrum suppo [Enabled] ^|Sets the system boot
|                               +|order
|                               *|
| Wait AMC/RTM Timeout  0      *|
| Wait AMC/RTM Policy   [Auto] *|
|                               *|
| Setup Prompt Timeout  5      *|
| Bootup NumLock State  [On]   *|
|                               *|
| Boot Option Priorities      *|
| Boot Option #1         [Base Network 1] *|><: Select Screen
| Boot Option #2         [Base Network 2] *|^v: Select Item
| Boot Option #3         [Disabled]      *|Enter: Select
| Boot Option #4         [Disabled]      *|+/-: Change Opt.
| Boot Option #5         [Disabled]      *|F1: General Help
| Boot Option #6         [Disabled]      *|F2: Previous Values
| Boot Option #7         [Disabled]      *|F3: Optimized Defaults
|                               *|F4: Save  ESC: Exit
|                               v|
|                               6:08
|-----+-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

6. Select **Boot option #1** and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
Spread Spectrum suppo [Enabled]                ^|Sets the system boot
                                                +|order
                                                *|
Wait AMC/RTM Timeout  0                        *|
Wait AMC/RTM Policy/----- Boot Option #1 -----\
| Onboard-USBFloppy SMART eUSB 87 |
| Setup Prompt Timeou| USB1:USBCDRom SONY DVD RW DRX-S |
| Bootup NumLock Stat| SAS ID00 LUN0 ATA ST980818SM |
|                               | Base Network 1 |
| Boot Option Priorit| Base Network 2 |
| Boot Option #1 | FrontPanel Network | elect Screen
| Boot Option #2 | UEFI: Built-in EFI Shell | elect Item
| Boot Option #3 | Disabled | : Select
| Boot Option #4 | \-----/ Change Opt.
| Boot Option #5 | eneral Help
| Boot Option #6 | [Disabled] *|F2: Previous Values
| Boot Option #7 | [Disabled] *|F3: Optimized Defaults
|                               *|F4: Save ESC: Exit
|                               6:08 v|
-----+-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

7. Select **USBCDROM** device and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main  Advanced  IPMI  iSCSI  Boot  Security  Save & Exit
-----
|                                     ^|Sets the system boot |
| Spread Spectrum suppo  [Enabled]  +|order                |
|                                     *|                      |
| Wait AMC/RTM Timeout    0          *|                      |
| Wait AMC/RTM Policy/----- Boot Option #1 -----\         |
|                                     | Onboard-USBFloppy SMART eUSB 87 | |
| Setup Prompt Timeou| USB1:USBCDrom SONY DVD RW DRX-S |
| Bootup NumLock Stat| SAS ID00 LUN0 ATA ST980818SM |
|                                     | Base Network 1 |
| Boot Option Priorit| Base Network 2 |
| Boot Option #1 | FrontPanel Network | elect Screen |
| Boot Option #2 | UEFI: Built-in EFI Shell | elect Item |
| Boot Option #3 | Disabled | : Select |
| Boot Option #4 | \-----/ Change Opt. |
| Boot Option #5 | eneral Help |
| Boot Option #6 | [Disabled] *|F2: Previous Values |
| Boot Option #7 | [Disabled] *|F3: Optimized Defaults |
|                                     *|F4: Save  ESC: Exit |
|                                     6:08 v|                      |
|-----+-----|
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

When **<Enter>** is pressed, **Boot option #1** changes to **USBCDROM** device.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Spread Spectrum suppo [Enabled]                ^| Sets the system boot
|                               +| order
|                               *|
| Wait AMC/RTM Timeout  0                        *|
| Wait AMC/RTM Policy    [Auto]                   *|
|                               *|
| Setup Prompt Timeout  5                        *|
| Bootup NumLock State   [On]                     *|
|                               *|
| Boot Option Priorities                          *|
| Boot Option #1          [USB1:USBCDRom SONY...] *|><: Select Screen
| Boot Option #2          [Base Network 2]         *|^v: Select Item
| Boot Option #3          [Disabled]               *|Enter: Select
| Boot Option #4          [Disabled]               *|+/-: Change Opt.
| Boot Option #5          [Disabled]               *|F1: General Help
| Boot Option #6          [Disabled]               *|F2: Previous Values
| Boot Option #7          [Disabled]               *|F3: Optimized Defaults
|                               *|F4: Save  ESC: Exit
|                               v|
|                               +|
-----
                          6:08
-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

8. Select **Boot option #2** and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Spread Spectrum suppo [Enabled]                ^| Sets the system boot
|                               +| order
|                               *|
| Wait AMC/RTM Timeout  0                        *|
| Wait AMC/RTM Policy    [Auto]                   *|
|                               *|
| Setup Prompt Timeout  5                        *|
| Bootup NumLock State   [On]                     *|
|                               *|
| Boot Option Priorities                          *|
| Boot Option #1          [USB1:USBCDRom SONY...] *|><: Select Screen
| Boot Option #2          [Base Network 2]         *|^v: Select Item
| Boot Option #3          [Disabled]               *|Enter: Select
| Boot Option #4          [Disabled]               *|+/-: Change Opt.
| Boot Option #5          [Disabled]               *|F1: General Help
| Boot Option #6          [Disabled]               *|F2: Previous Values
| Boot Option #7          [Disabled]               *|F3: Optimized Defaults
|                               *|F4: Save  ESC: Exit
|                               v|
|                               +|
-----
                          6:08
-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

9. Select **hard disk** and then press **<Enter>**.

In the screenshot hard disk is **ID00 LUN0**, but name of hard disk may vary depending upon type of RTM-ATCA-7360. For example, hard disk may also be shown as **Elx 00 500000E011B0C0B1,00 0F 1** on RTM-ATCA-7360-FC.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
|
| Spread Spectrum suppo    [Enabled]                                ^|Sets the system boot
|                                                                    ^|order
|                                                                    *|
| Wait AMC/RTM Timeout    0                                       *|
| Wait AMC/RTM Policy/----- Boot Option #2 -----\
|                               | Onboard-USBFloppy SMART eUSB 87 |
| Setup Prompt Timeou| USB1:USBCDRom SONY DVD RW DRX-S |
| Bootup NumLock Stat| SAS ID00 LUN0 ATA ST980818SM |
|                               | Base Network 1 |
| Boot Option Priorit| Base Network 2 |
| Boot Option #1      | FrontPanel Network | elect Screen
| Boot Option #2      | UEFI: Built-in EFI Shell | elect Item
| Boot Option #3      | Disabled | : Select
| Boot Option #4      | \-----/ Change Opt.
| Boot Option #5      | general Help
| Boot Option #6      | [Disabled] *|F2: Previous Values
| Boot Option #7      | [Disabled] *|F3: Optimized Defaults
|                               *|F4: Save ESC: Exit
|                               |
|                               6:08 v|
|-----+-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

When **<Enter>** is pressed, Boot option #2 changes to hard disk.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
/-----+-----\
| Spread Spectrum suppo [Enabled]          ^|Sets the system boot |
|                                     +|order                |
|                                     *|                      |
| Wait AMC/RTM Timeout   0                *|                      |
| Wait AMC/RTM Policy    [Auto]            *|                      |
|                                     *|                      |
| Setup Prompt Timeout   5                *|                      |
| Bootup NumLock State   [On]              *|                      |
|                                     *|                      |
| Boot Option Priorities                    *|                      |
| Boot Option #1         [USB1:USBCDRom SONY...] *|>: Select Screen    |
| Boot Option #2         [SAS ID00 LUN0 ATA ...] *|^v: Select Item      |
| Boot Option #3         [Disabled]          *|Enter: Select       |
| Boot Option #4         [Disabled]          *|+/-: Change Opt.    |
| Boot Option #5         [Disabled]          *|F1: General Help    |
| Boot Option #6         [Disabled]          *|F2: Previous Values |
| Boot Option #7         [Disabled]          *|F3: Optimized Defaults|
|                                     *|F4: Save  ESC: Exit  |
|                                     v|                      |
|                                     -----+-----\
|                                     6:08                |
|                                     Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

10. Go to **Save & Exit** menu, select **Save Changes and Exit** and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Save Changes and Exit          ^| Exit system setup after  |
| Discard Changes and Exit      *| saving the changes.    |
| Save Changes and Reset       *|                          |
| Discard Changes and Reset     *|                          |
|                               *|                          |
| Save Options                  *|                          |
| Save Changes                  *|                          |
| Discard Changes               *|                          |
|                               *|                          |
| Restore Defaults              *|                          |
|                               *|                          |
|                               *|><: Select Screen      |
| Boot Override                 *|^v: Select Item         |
| Onboard-USBFloppy SMART eUSB 87 *|Enter: Select          |
| USB1:USB CDROM SONY DVD RW DRX-S *|+/-: Change Opt.       |
| SAS ID00 LUN0 ATA ST980818SM  *|F1: General Help       |
| Base Network 1                 *|F2: Previous Values    |
| Base Network 2                 *|F3: Optimized Defaults  |
| FrontPanel Network             +|F4: Save  ESC: Exit     |
|                               v|                          |
|                               +|                          |
-----
6:08

```

11. Select **Yes** and then press **<Enter>**, system exits from BIOS.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
| Save Changes and Exit          ^|Exit system setup after |
| Discard Changes and Exit      *|saving the changes.   |
| Save Changes and Reset        *|                          |
| Discard Changes and Reset     *|                          |
|                               *|                          |
| Save Options                  /----- Save & Exit Setup -----\
| Save Changes                  | Save configuration and exit? |
| Discard Changes               |                               |
|                               |                               |
| Restore Defaults              |                               |
|                               | Yes      No      | Select Screen
| Boot Override                 \-----/          | Select Item
| Onboard-USBFloppy SMART       r: Select
| USB1:USBCDRom SONY DVD RW DRX-S *|+/-: Change Opt.
| SAS ID00 LUN0 ATA ST980818SM  *|F1: General Help
| Base Network 1                *|F2: Previous Values
| Base Network 2                *|F3: Optimized Defaults
| FrontPanel Network            +|F4: Save  ESC: Exit
|                               6:08          v|
|-----+-----
| Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

2.2.3 Text Mode Installation

Procedure

After meeting prerequisites described in section [Prerequisites on page 18](#) and completing installation setup as described in [Installation Setup on page 18](#), perform following steps for installation in text mode over serial console:

1. Insert CD1 or DVD of RHEL 5 update 6 Server Edition in DVD/CD-ROM.
2. Reset the blade using shelf manager or reset button provided at front panel of the blade. When blade boots up after the reset, the following output is displayed.

```
Emerson ATCA-7367 BIOS Version 1.0.3 (07/13/2010 - 09:26:42)

Board-Info:
  FPGA version: 04
  CPLD version: 2
  Reset Cause: CPU
  BIOS Boot Mode: Normal
  Boot Flash Selection: Bank B (IPMI)
  Flash Bank A: WP off
  Flash Bank B: WP off
  IPMC Version: 2.0.0.000000008
  ATCA Power Level 2: 152.0 Watt - No Power Limit
```

3. The blade boots up with CD1 or DVD, and **boot:** prompt as shown in the below screenshot.

```
- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.

[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: █
```

4. Type **linux console=ttyS0,9600n8** at **boot:** prompt as shown in the below screenshot.

```
- To install or upgrade in graphical mode, press the <ENTER> key.  
- To install or upgrade in text mode, type: linux text <ENTER>.  
- Use the function keys listed below for more information.  
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]  
boot: linux console=ttyS0,9600n8
```

5. Press **<Enter>** and then system starts booting up as shown below.

```
- To install or upgrade in graphical mode, press the <ENTER> key.  
- To install or upgrade in text mode, type: linux text <ENTER>.  
- Use the function keys listed below for more information.  
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]  
boot: linux console=ttyS0,9600n8  
Loading vmlinuz.....  
Loading initrd.img.....
```

6. In **Choose a Language** window, select preferred language, and then press **<Enter>**.

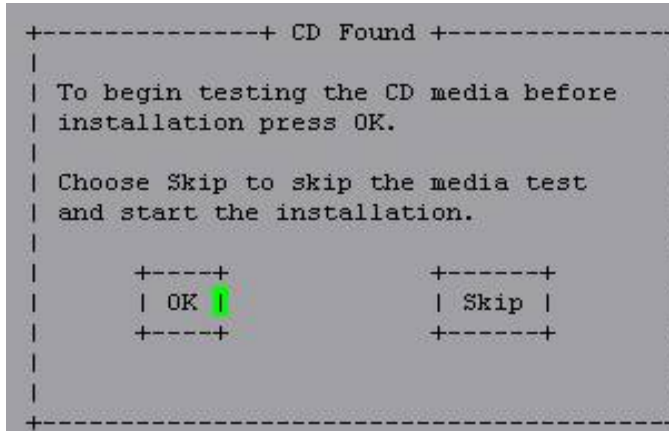
```
Welcome to Red Hat Enterprise Linux Server

+-----+ Choose a Language +-----+
|
| What language would you like to use
| during the installation process?
|
| Catalan ^
| Chinese(Simplified) :
| Chinese(Traditional) #
| Croatian :
| Czech :
| Danish :
| Dutch :
| English v
|
| +-----+
| | OK |
| +-----+
|
+-----+
```

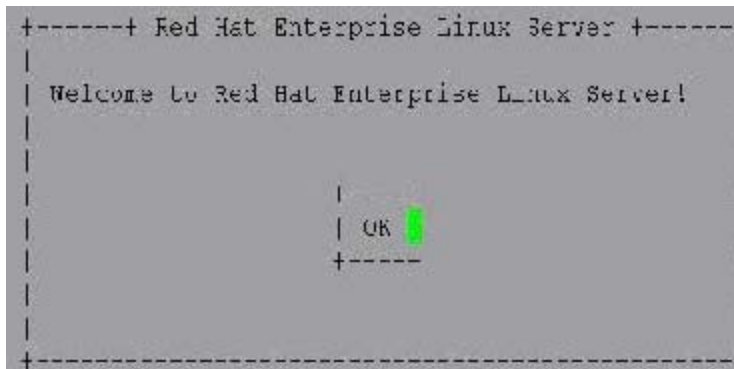
7. In **Installation Method** window, select **Local CDROM**, and then press **<Enter>**.

```
+-----+ Installation Method +-----+
|
| What type of media contains the
| packages to be installed?
|
| Local CDROM
| Hard drive
| NFS image
| FTP
| HTTP
|
| +-----+ +-----+
| | OK | | Back |
| +-----+ +-----+
|
+-----+
```

8. In **CD Found** window, select **OK** and press **<Enter>** to test the CD or DVD media, or select **Skip** to skip the media test.



9. After completing or skipping media test, **Red Hat Enterprise Linux Server** window is displayed. Select **OK** and then press **<Enter>**.



10. Enter **Installation Number** located in the installation package provided by Red Hat, select **OK** and then press **<Enter>**.
If installation package does not have an installation number and user subscription is activated by Red Hat, then select **Skip entering Installation Number** and press **<Enter>**.

```
+-----+ Installation Number +-----+
|
| To install the full set of supported packages included in your |
| subscription, please enter your Installation Number           |
|
| (*) Installation Number _____ |
|      ( ) Skip entering Installation Number                   |
|
|                                     +----+ +-----+ |
|                                     | OK | | Back | |
|                                     +----+ +-----+ |
|
+-----+-----+-----+-----+
```

11. Installation process searches for existing Linux installation. If installation of Linux is found then **System to Upgrade** window is displayed, select **Reinstall System** to freshly install the system or select existing RHEL installation to upgrade it, and then press **<Enter>**. For information on upgrading existing Linux installation, refer http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/ch02s01.html

```
+-----+ System to Upgrade +-----+
|
|   One or more existing Linux installations have been
|   found on your system.
|
|   Please choose one to upgrade, or select 'Reinstall
|   System' to freshly install your system.
|
| Reinstall System
| Red Hat Enterprise Linux Server 5.4 (/dev/VolGroup01/LogVol00)
|
|           +----+           +-----+
|           | OK |           | Back |
|           +----+           +-----+
|
|
```

12. In **Partitioning Type** window, select devices to be used for installation and press **<Enter>**.

```

+-----+ Partitioning Type +-----+
|
|  Installation requires partitioning of your hard drive.  The
|  default layout is reasonable for most users.  You can either
|  choose to use this or create your own.
|
|  Remove all partitions on selected drives and create default layout.
|  Remove linux partitions on selected drives and create default layout.
|  Use free space on selected drives and create default layout.
|  Create custom layout.
|
|  Which drive(s) do you want to use for this installation?
|                                     [*] sda ^
|                                     [*] sdb #
|
|                                     +-----+ +-----+
|                                     | OK |   | Back |
|                                     +-----+ +-----+
|

```

13. Perform disk partitioning of the devices selected in the previous step, using guidelines given under *section 4.15 to 4.18 of RHEL Installation Guide* located at http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/s1-diskpartsetup-x86.html
14. In **Boot Loader Configuration** window, select **Use GRUB Boot Loader** to install grub boot loader or **No Boot Loader**, then select **OK** and press **<Enter>**.

```

+-----+ Boot Loader Configuration +-----+
|
|  Which boot loader would you like to use?
|
|  (*) Use GRUB Boot Loader
|  ( ) No Boot Loader
|
|                                     +-----+ +-----+
|                                     | OK |   | Back |
|                                     +-----+ +-----+
|

```

If **Use GRUB Boot Loader** is selected then you have to perform the following steps to configure grub:

1. Enter **console=ttyS0,9600n8**, select **OK**, and then press **<Enter>**.

```
+-----+ Boot Loader Configuration +-----+
|
| A few systems will need to pass special options to the kernel
| at boot time for the system to function properly. If you need
| to pass boot options to the kernel, enter them now. If you
| don't need any or aren't sure, leave this blank.
|
| console=ttyS0,9600n8_____
|
| [ ] Force use of LBA32 (not normally required)
|
| +----+ +-----+
| | OK | | Back |
| +----+ +-----+
|
+-----+
```

2. If you want to make grub boot loader password protected then select **Use a grub Password**, enter boot loader password and confirm the same, select **OK** and then press **<Enter>**. Otherwise select only **OK** and press **<Enter>**.

```
+-----+ Boot Loader Configuration +-----+
|
| A boot loader password prevents users from passing
| arbitrary options to the kernel. For highest
| security, we recommend setting a password, but this
| is not necessary for more casual users.
|
| [ ] Use a GRUB Password
|
| Boot Loader Password: _____
| Confirm:               _____
|
| +----+ +-----+
| | OK | | Back |
| +----+ +-----+
|
+-----+
```

3. You are prompted to edit boot label, output depends on disk partitioning. If you want to edit boot label then select **boot label** and **Edit**, press **<Enter>**. After editing boot label, select **OK** and then press **<Enter>**.

```
+-----+ Boot Loader Configuration +-----+
|
| The boot manager Red Hat Enterprise Linux Server uses
| can boot other operating systems as well. You need to
| tell me what partitions you would like to be able to
| boot and what label you want to use for each of them.
|
| Default  Boot label          Device
|  ^      Red Hat Enterprise Linux Server /dev/sda2
|
|                                     ^
|                                     :
|                                     :
|                                     #
|                                     v
|
|          +-----+          +-----+          +-----+
|          | OK |          | Edit |          | Back |
|          +-----+          +-----+          +-----+
|
+-----+
```

4. Select a device to install boat loader, select **OK** and then press **<Enter>**.

```
+-----+ Boot Loader Configuration +-----+
|
| Where do you want to install the boot loader?
|
| /dev/sda      Master Boot Record (MBR)
| /dev/sda1     First sector of boot partition
|
|          +-----+          +-----+
|          | OK |          | Back |
|          +-----+          +-----+
|
+-----+
```

15. For network configuration, select an Ethernet device and select **Edit**, and then press **<Enter>** to configure the selected Ethernet device. Configure Ethernet devices as per network configuration of organization.

```
+-----+ Network Configuration +-----+
|
| The current configuration settings for each interface are listed
| next to the device name. Unconfigured interfaces are shown as
| UNCONFIGURED. To configure an interface, highlight it and choose
| Edit. When you are finished, press OK to continue.
|
|          eth0: UNCONFIGURED  ^
|          eth1: UNCONFIGURED  #
|          eth2: UNCONFIGURED  :
|          eth3: UNCONFIGURED  :
|          eth4: UNCONFIGURED  v
|
|          +-----+          +-----+          +-----+
|          | Edit |          | OK |          | Back |
|          +-----+          +-----+          +-----+
|
+-----+
```

16. If host name of the blade is assigned by DHCP server and dynamic network configuration is done in previous step, then select **automatically via DHCP**. Otherwise select **manually** and enter desired host name. Select **OK** and press **<Enter>**.

```
+-----+ Hostname Configuration +-----+
|
| If your system is part of a larger network where hostnames are
| assigned by DHCP, select automatically via DHCP. Otherwise,
| select manually and enter in a hostname for your system. If you
| do not, your system will be known as 'localhost.'
|
|  (*) automatically via DHCP
|  ( ) manually
|
|          +-----+
|          | OK |
|          +-----+
|
|          +-----+
|          | Back |
|          +-----+
|
+-----+
```

17. Select **System clock uses UTC** to use UTC time, then select **OK** and press **<Enter>**. Otherwise you can select time zone based upon the location, select **OK** and press **<Enter>**.

```
+-----+ Time Zone Selection +-----+
|
| What time zone are you located in?
|
| [*] System clock uses UTC
|
| America/Montevideo      ^
| America/Montreal        #
| America/Montserrat      :
| America/Nassau          :
| America/New_York        v
|
|           +-----+           +-----+
|           | OK |           | Back |
|           +-----+           +-----+
|
+-----+
```

18. **Root Password** window is displayed. Enter desired password and confirm the same. Select **OK** and press **<Enter>**.

```

+-----+ Root Password +-----+
|
| Pick a root password. You must type it
| twice to ensure you know what it is and
| didn't make a mistake in typing. Remember
| that the root password is a critical part
| of system security!
|
| Password:          *****
| Password (confirm): *****
|
|           +-----+           +-----+
|           | OK |           | Back |
|           +-----+           +-----+
|
+-----+

```

19. In **Package selection** window, select packages to be installed. Select **OK** and press **<Enter>**.

```

+-----+ Package selection +-----+
|
| The default installation of Red Hat Enterprise
| Linux Server includes a set of software applicable
| for general internet usage. What additional tasks
| would you like your system to include support for?
|
|           [X] Software Development
|           [ ] Web server
|
|           [ ] Customize software selection
|
|           +-----+           +-----+
|           | OK |           | Back |
|           +-----+           +-----+
|
+-----+

```

RHEL starts checking dependencies.

```
+-----+ Dependency Check +-----+
|
| Checking dependencies in packages selected for installation...
|
|                                     50%
|
+-----+
```

20. When dependency check is completed, **Installation to begin** window is displayed. Select **OK** and press **<Enter>** to start installation.

```
+-----+ Installation to begin +-----+
|
| A complete log of your installation will
| be in /root/install.log after rebooting
| your system. You may want to keep this
| file for later reference.
|
|                                     +-----+
|                                     | OK |
|                                     +-----+
|                                     +-----+
|                                     | Back |
|                                     +-----+
|
+-----+
```

21. If CDs are used for installation then **Required Install Media** window is displayed. You should make sure that CDs shown in the window are available. Depending upon the package selection done in step 19 and RHEL 5 version, number of required CDs may vary.

If all CDs shown in the window are available, then select **Continue** to start installation or select **Reboot** to reboot the blade, else select **Back** to go back and modify selected packages to be installed. Press **<Enter>**.

```
+-----+ Required Install Media +-----+
|
| The software you have selected to install will
| require the following CDs:
|
|         Red Hat Enterprise Linux Server 5 CD #1
|         Red Hat Enterprise Linux Server 5 CD #2
|         Red Hat Enterprise Linux Server 5 CD #3
|
| Please have these ready before proceeding with the
| installation. If you need to abort the installation
| and reboot please select "Reboot".
|
|   +-----+   +-----+   +-----+
|   | Reboot |   | Back  |   | Continue |
|   +-----+   +-----+   +-----+
|
+-----+
```

22.If RHEL CDs are being used for installation then you need to change CDs as prompted during installation.

23. When installation of RHEL Server Edition is completed, **Complete** window is displayed. Remove installation CD or DVD, select **Reboot** and press **<Enter>** to reboot the blade.

```
+-----+ Complete +-----+
|
| Congratulations, your Red Hat Enterprise Linux Server
| installation is complete.
|
| Remove any media used during the installation process
| and press <Enter> to reboot your system.
|
|                                     +-----+
|                                     | Reboot |
|                                     +-----+
|
+-----+
```

24. After the reboot, the blade boots up with RHEL. During boot up **Setup Agent** utility is displayed to changes and configure RHEL. You can configure the system, else select **Exit** and then press **<Enter>** to continue boot up of the blade.
25. As system boots up, login prompt is shown, enter user name as **root** and password as entered in step 18, page 41.
26. Register the blade with Red Hat Network using guidelines at:
<https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

2.2.4 Graphical Mode Installation

Procedure

After meeting prerequisites described in section [Prerequisites on page 18](#) and completing installation setup as described in [Installation Setup on page 18](#), perform following steps for installation in graphical mode using Virtual Network Computing (VNC):

1. Follow the steps 1 to 3 described in [Text Mode Installation on page 29](#).
2. Type **linux console=ttyS0,9600n8 vnc** at **boot:** prompt as shown in the following screenshot.

```
- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.

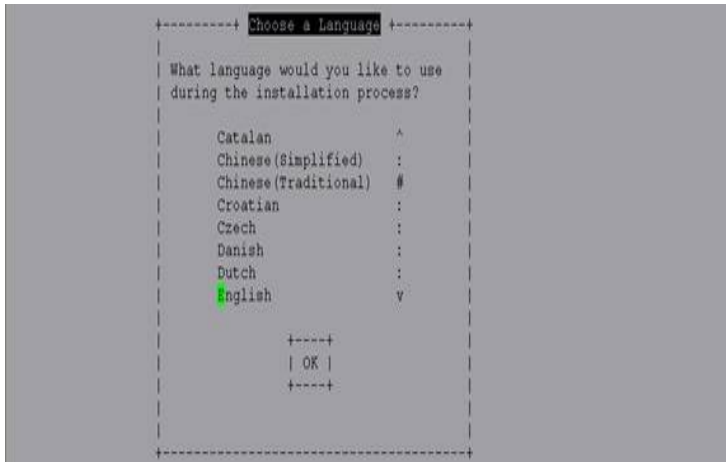
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux console=ttyS0,9600n8 vnc
```

3. Press **<Enter>** and system starts booting up as shown below.

```
- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.

[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux console=ttyS0,9600n8 vnc
Loading vmlinuz.....
Loading initrd.img.....
```

4. In **Choose a language** window, select preferred language and press **<Enter>**.



5. In **Installation Method** window, select **Local CDROM** and press **<Enter>**.



6. Select Ethernet interface corresponding to Intel chipset 82567LM-2, which is the front panel Ethernet interface of the blade, and then press **<Enter>**.

```
Welcome to Red Hat Enterprise Linux Server

+-----+ Networking Device +-----+
|
| You have multiple network devices on this system. Which would
| you like to install through?
|
| eth0 - Intel Corporation 82567LM-2 Gigabit Network Connection
| eth1 - Intel Corporation 82572EI Gigabit Ethernet Controller
| eth2 - Intel Corporation 82576 Gigabit Network Connection
| eth3 - Intel Corporation 82576 Gigabit Network Connection
| eth4 - Intel Corporation 82599EB 10-Gigabit Dual Port Network Connection
| eth5 - Intel Corporation 82599EB 10-Gigabit Dual Port Network Connection
|
|          +----+          +-----+          +-----+
|          | OK |          | Identify |          | Back |
|          +----+          +-----+          +-----+
|
+-----+

<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen
```

- Configure the front panel Ethernet interface according to network configuration of organization, select **OK** and then press **<Enter>**.

```
+-----+ Configure TCP/IP +-----+
|
| [*] Enable IPv4 support
|      (*) Dynamic IP configuration (DHCP)
|      ( ) Manual configuration
|
| [*] Enable IPv6 support
|      (*) Automatic neighbor discovery (RFC 2461)
|      ( ) Dynamic IP configuration (DHCP)
|      ( ) Manual configuration
|
|      +-----+      +-----+
|      | OK |      | Back |
|      +-----+      +-----+
|
+-----+
```

- In the **CD Found** window, select **OK** and press **<Enter>** to test the CD or DVD media or select **Skip** to skip the media test and press **<Enter>**.

```
+-----+ CD Found +-----+
|
| To begin testing the CD media before
| installation press OK.
|
| Choose Skip to skip the media test
| and start the installation.
|
|      +-----+      +-----+
|      | OK |      | Skip |
|      +-----+      +-----+
|
+-----+
```

9. After completing or skipping media test, you are prompted to select **User text mode** or **Start VNC** method for installation. Select **Start VNC** and press **<Enter>**.

```
+-----+ Would you like to use VNC? +-----+
|
| The VNC mode installation offers more
| functionality than the text mode, would
| you like to use it instead?
|
|   +-----+   +-----+
|   | Use text mode |   | Start VNC |
|   +-----+   +-----+
```

10. If authentication is required while connecting to the blade using VNC viewer, then enter VNC server password and confirm it, or select **No password** and press **<Enter>**.

```
+-----+ VNC Configuration +-----+
|
| A password will prevent unauthorized
| listeners connecting and monitoring your
| installation progress. Please enter a
| password to be used for the installation
|
|   Password: _____
|   Password (confirm): _____
|
|   +-----+   +-----+   +-----+
|   | OK |   | No password |   | Back |
|   +-----+   +-----+   +-----+
```

11. After completing VNC configuration, VNC server starts on the blade. Start VNC viewer on your system and connect VNC Server running on the blade. For example as shown in screenshot, VNC server is running on 10.130.98.96:1, hence you need to use 10.130.98.96:1 to connect to the blade. If you are prompted for authentication then enter password which has been entered in last step.

```
Running anaconda, the Red Hat Enterprise Linux Server system installer - please wait...
Probing for video card:  Unable to probe
No video hardware found, assuming headless
Starting VNC...

WARNING!!! VNC server running with NO PASSWORD!
You can use the vncpassword=<password> boot option
if you would like to secure the server.

The VNC server is now running.
Please connect to 10.130.98.96:1 to begin the install...
Press <enter> for a shell
Starting graphical installation...
XKB extension not present on :1
```

12. When you get connected to the blade using VNC viewer, the following window is displayed. Click **next**.



13. Enter **Installation Number** located in the installation package provided by Red Hat and click **OK**. If installation package does not have an installation number and user subscription is activated by Red Hat, then select **Skip entering Installation Number** and click **OK**.



The image shows a dialog box titled "Installation Number". The text inside asks if the user wants to enter an Installation Number (sometimes called Subscription Number) now, explaining that this feature enables the installer to access extra components. It also provides a URL: <http://www.redhat.com/InstNum/>. There are two radio buttons: "Installation Number:" (which is selected) and "Skip entering Installation Number". At the bottom right, there are two buttons: "Back" and "OK".

Installation Number

Would you like to enter an Installation Number (sometimes called Subscription Number) now? This feature enables the installer to access any extra components included with your subscription. If you skip this step, additional components can be installed manually later.

See <http://www.redhat.com/InstNum/> for more information.

☒ Installation Number:

☐ Skip entering Installation Number

14. Installation process searches for existing Linux installation. If installation of Linux is found then **System to Upgrade** window is displayed, click **Install Red Hat Enterprise Linux Server** to freshly install the system, or **Upgrade an existing Installation** to upgrade existing RHEL Server installation. Click **Next**. For information on upgrading existing linux installation, refer http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/ch02s01.html



15. Select devices to be used for installation and do disk partitioning using guidelines given under *section 4.15 to 4.18 of RHEL Installation Guide* located at http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/s1-diskpartsetup-x86.html

After disk partitioning, click **Next**.



16.If installation is about to erase existing data on disk, then following warning message is displayed. Click **Yes** or **No**, depending on whether the existing data should be erased or not. If you do not want to erase existing data on disk then click **No** and do disk partitioning again.



17. After disk partitioning, a window to configure network devices is displayed. Select a network interface and click **Edit** to configure. After configuring network devices, click **Next**.

The screenshot shows the 'Network Devices' configuration window in the Red Hat Enterprise Linux 5 installer. The window has a red header with the text 'RED HAT ENTERPRISE LINUX 5'. Below the header, the 'Network Devices' section contains a table with columns: 'Active on Boot', 'Device', 'IPv4/Netmask', and 'IPv6/Prefix'. There is an 'Edit' button to the right of the table. The table lists three network interfaces: eth0, eth1, and eth2, all configured with DHCP and Auto for IPv6. Below the table, the 'Hostname' section has a label 'Set the hostname:' and two radio buttons: 'automatically via DHCP' (selected) and 'manually' (with a text input field containing 'localhost.localdomain' and a hint '(e.g., host.domain.com)'). The 'Miscellaneous Settings' section has three text input fields for 'Gateway:', 'Primary DNS:', and 'Secondary DNS:'. At the bottom left is a 'Release Notes' button, and at the bottom right are 'Back' and 'Next' buttons.

Active on Boot	Device	IPv4/Netmask	IPv6/Prefix
☒	eth0	DHCP	Auto
☐	eth1	DHCP	Auto
☐	eth2	DHCP	Auto

Hostname
Set the hostname:

☒ automatically via DHCP

☐ manually (e.g., host.domain.com)

Miscellaneous Settings

Gateway:

Primary DNS:

Secondary DNS:

[Release Notes](#) [Back](#) [Next](#)

18. Select **System clock uses UTC**, or change the region according to your location, and then click **Next**.



19. Enter desired password for root account and confirm it, then click **Next**.



**RED HAT
ENTERPRISE LINUX 5**

 The root account is used for administering the system. Enter a password for the root user.

Root Password:

Confirm:

[Release Notes](#) [Back](#) [Next](#)

20. Select packages to be installed, and then click **Next**.



**RED HAT
ENTERPRISE LINUX 5**

The default installation of Red Hat Enterprise Linux Server includes a set of software applicable for general internet usage. What additional tasks would you like your system to include support for?

☐ Software Development

☐ Web server

You can further customize the software selection now, or after install via the software management application.

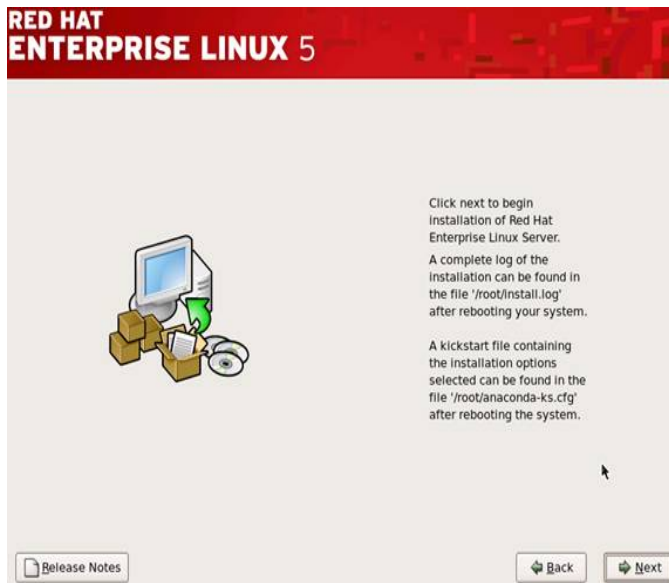
☒ Customize later ☐ Customize now

[Release Notes](#) [Back](#) [Next](#)

21. Checking dependencies starts.



22. Click **Next** and press **<Enter>** to start installation.

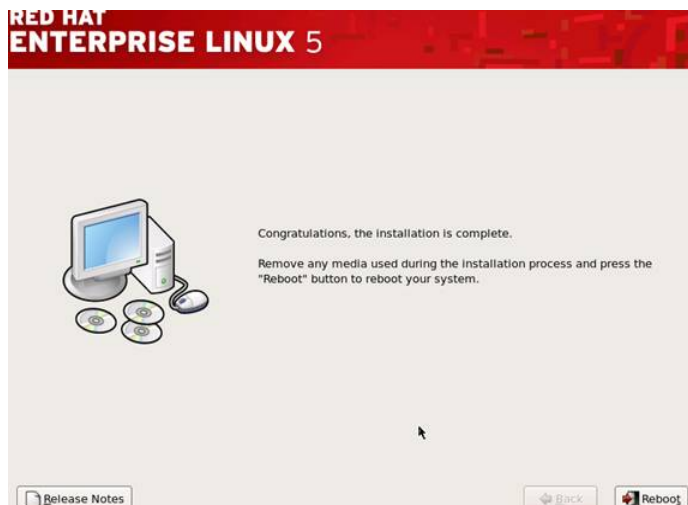


23.If CDs are used for installation then the following window is displayed. You should make sure that CDs shown in following window are available. Depending upon package selection done in step 20 and RHEL 5 version, number of required CDs may vary. If all CDs shown in window are available, then click **Continue** to start installation, or click **Reboot** to reboot the blade, else click **Back** to go back and do package selection again.



24.If RHEL CDs are being used for installation then you need to change CDs as prompted during installation.

25. When installation is completed, remove installation CD or DVD, and then click **Reboot** to reboot the blade.



26. When system comes up after reboot, **Setup Agent utility** window is displayed to changes and configure system. Select **Exit** and press **<Enter>** to continue boot up of the blade.
27. When system boots up after reboot, login prompt is displayed. Enter user name as **root** and password as entered in step 19, page 57.
28. Register the blade with Red Hat Network using guidelines given at:
<https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

2.3 PXE Network Installation

Using Preboot Execution Environment (PXE) network installation method, RHEL can be installed over network using Network File System (NFS), File Transfer Protocol (FTP), or Hyper Text Transfer Protocol (HTTP) protocols. For more information refer, *chapter 31 of RHEL installation Guide* located at http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/index.html

You can do installation in text mode and graphical mode using PXE network installation method.

2.3.1 Prerequisites

You need to meet following prerequisites:

- The blade is connected directly or indirectly to Trivial File Transfer Protocol (TFTP) or Dynamic Host Configuration Protocol (DHCP) server over Ethernet.
- The blade is connected directly or indirectly to NFS, FTP, or HTTP Server having installation tree over Ethernet.

You should have following software before starting installation:

- Installation CDs or DVD or ISO image of RHEL 5 update 6 Server Edition
- VNC viewer, if you want to do installation in graphical mode



To install 32 bit operating system, use x86 iso image or install CDs of RHEL 5 update 6 and for 64 bit operating system use x86_64 iso image or install CDs of RHEL 5 update 6.

2.3.2 Installation Setup

Procedure

1. Prepare for PXE based network installation using guidelines given under *section 2.5 of RHEL Installation Guide* located at, http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/index.html
2. Configure standard TFTP servers, Berkeley Software Distribution (BSD) compatible
 1. Login to TFTP server using root account.
 2. Create the file `/etc/xinetd.d/tftp` with the following contents.

```
service tftp
```

```
{
  socket_type = dgram
  wait = yes
  user = root
  server = /usr/sbin/in.tftpd
  server_args = -s /tftpboot
  per_source = 11
  cps=100 2
  flags=IPv4
  disable = no
  protocol = udp
}
```

3. Create `/tftpboot/ATCA-7367/pxelinux.cfg` directory on TFTP server.
#mkdir -p /tftpboot/ATCA-7367/pxelinux.cfg
 4. Copy `pxelinux.0` from the SYSLINUX distribution in `/tftpboot/ATCA-7367` directory.
 5. Copy all files from `images/pxeboot` directory of CD1, DVD, or iso image of RHEL installation in `/tftpboot/ATCA-7367` directory.
 6. Create default file inside `/tftpboot/ATCA-7367/pxelinux.cfg` directory.
default vmlinuz initrd=initrd.img console=ttyS0,9600n8 text
 7. Restart TFTP daemon.
#/etc/init.d/xinetd restart
3. In order to assign IP address to the blade and download a boot image from a TFTP server, configure the DHCP server. The DHCP server is typically configured through a configuration file `dhcpd.conf`. Many configurable options can be left at their default values, but configure the following minimum options:
- Domain name
 - Subnet mask
 - Router IP address

- NTP server IP address
- IP address of server from which initial boot file is to be loaded, next server option.

Following is an example of DHCP file:

```
#*****start of configuration*****

ddns-update-style interim;

ignore client-updates;

allow bootp;

allow booting;

allow booting;

allow bootp;


# Standard configuration directives...

#options fields are mandatory for RHEL installation on ATCA-7367
blade

option domain-name "www.emerson.com";

option subnet-mask 255.255.255.0;

option broadcast-address 10.232.91.255;

option domain-name-servers 10.232.22.25;

option routers 10.232.91.254;

option ntp-servers 10.232.88.125;

option time-offset 18000;

subnet 10.232.91.0 netmask 255.255.255.0

{
```

```
range 10.232.91.10 10.232.91.40;#mandatory  
next-server 10.232.88.125; #mandatory  
filename "ATCA-7367/pxelinux.0"; # mandatory  
# ATCA-7367/pxelinux.0 this is the place where we expect  
# to pick the pxe configuration from, please read point 4 of above  
step 2  
}
```

After editing `/etc/dhcpd.conf`, restart the DHCP server on interface which should be used for assigning IP address to the blade. For more information, refer `dhcpd.conf` linux man page located at

<http://linux.die.net/man/5/dhcpd.conf> and `dhcpd` linux man page located at <http://linux.die.net/man/8/dhcpd>

4. Follow steps 1 through 6 described in [Installation Setup on page 18](#).

5. Select **Base Network 1**, **Base Network 2**, or **FrontPanel Network** depending on the following and press **<Enter>**:
 - Select **Base Network 1**, if DHCP server is configured and running on the ATCA controller blade of logical slot 1 in chassis.
 - Select **Base Network 2**, if DHCP server is configured and running on the ATCA controller blade of logical slot 2 in chassis.
 - Select **FrontPanel Network**, if DHCP server is accessible by using the front panel interface of blade.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
| Boot Configuration                                ^|Sets the system boot | |
|> Option ROM Execution                             *|order              |
|                                                    *|              |
| Spread Spectrum suppo [Enabled]                  *|              |
|                                                    |              |
| /----- Boot Option #1 -----\                |              |
| Wait AMC/RTM Timeou| Onboard-USBFloppy SMART eUSB 87 |          |
| Wait AMC/RTM Policy| USB1:USBCDRom SONY DVD RW DRX-S |          |
|                    | SAS ID00 LUN0 ATA ST980818SM    |          |
| Setup Prompt Timeou| Base Network 1                |          |
| Bootup NumLock Stat| Base Network 2                  |          |
|                    | FrontPanel Network              | elect Screen    |
| Boot Option Priorit| UEFI: Built-in EFI Shell        | elect Item      |
| Boot Option #1    | Disabled                                              | : Select        |
| Boot Option #2     | \-----/ Change Opt.                               |
| Boot Option #3     |                                     eneral Help      |
| Boot Option #4     | [Disabled]                                         *|F2: Previous Values |
| Boot Option #5     | [Disabled]                                         *|F3: Optimized Defaults |
| Boot Option #6     | [Disabled]                                         +|F4: Save ESC: Exit   |
|                                                            v|              |
|-----+-----|
| Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

- Go to **Save & Exit** tab, select **Save Changes and Exit** and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Save Changes and Exit          ^|Exit system setup after |
| Discard Changes and Exit      *|saving the changes.    |
| Save Changes and Reset        *|                          |
| Discard Changes and Reset     *|                          |
|                               *|                          |
| Save Options                  *|                          |
| Save Changes                  *|                          |
| Discard Changes               *|                          |
|                               *|                          |
| Restore Defaults              *|                          |
|                               *|                          |
|                               *|><: Select Screen   |
| Boot Override                 *|^v: Select Item        |
| Onboard-USBFloppy SMART eUSB 87 *|Enter: Select         |
| USB1:USB CDROM SONY DVD RW DRX-S *|+/-: Change Opt.      |
| SAS ID00 LUN0 ATA ST980818SM  *|F1: General Help      |
| Base Network 1                *|F2: Previous Values   |
| Base Network 2                *|F3: Optimized Defaults |
| FrontPanel Network            +|F4: Save  ESC: Exit    |
|                               v|                          |
|-----+-----|
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```

- Select **Yes** and press **<Enter>**. System exits from BIOS.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Save Changes and Exit          ^|Exit system setup after |
| Discard Changes and Exit      *|saving the changes.    |
| Save Changes and Reset        *|                          |
| Discard Changes and Reset     *|                          |
|                               *|                          |
| Save Options                  *|                          |
| Save Changes                  *|                          |
| Discard Changes               *|                          |
|                               *|                          |
| Restore Defaults              *|                          |
|                               *|                          |
|                               *|><: Select Screen   |
| Boot Override                 *|^v: Select Item        |
| Onboard-USBFloppy SMART eUSB 87 *|Enter: Select         |
| USB1:USB CDROM SONY DVD RW DRX-S *|+/-: Change Opt.      |
| SAS ID00 LUN0 ATA ST980818SM  *|F1: General Help      |
| Base Network 1                *|F2: Previous Values   |
| Base Network 2                *|F3: Optimized Defaults |
| FrontPanel Network            +|F4: Save  ESC: Exit    |
|                               v|                          |
|-----+-----|
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```

```

/----- Save & Exit Setup -----\
|                               |
| Save configuration and exit? |
|                               |
|                               |
| Yes      No                  |
|-----+-----|

```

2.3.3 Installation Procedure

This section explains PXE network installation in text mode over serial console and in graphical mode using VNC.

Procedure:

After meeting prerequisites described in [Prerequisites on page 61](#) and completing installation setup as described in [Installation Setup on page 61](#), perform the following steps to install RHEL 5 update 6 using PXE Network-Based Installation method.

1. Reset the blade using shelf manager or reset button provided at front panel of the blade. As blade boots up after reset, the following output is displayed on serial console.

```
Emerson ATCA-7367 BIOS Version 1.0.3 (07/13/2010 - 09:26:42)

Board-Info:
  FPGA version: 04
  CPLD version: 2
  Reset Cause: CPU
  BIOS Boot Mode: Normal
  Boot Flash Selection: Bank B (IPMI)
  Flash Bank A: WP off
  Flash Bank B: WP off
  IPMC Version: 2.0.0.00000008
  ATCA Power Level 2: 152.0 Watt - No Power Limit
```

2. As system boots up, the system obtains the IP Address from DHCP server and downloads the kernel image `vmLinux` and `initrd.img` file from TFTP server.

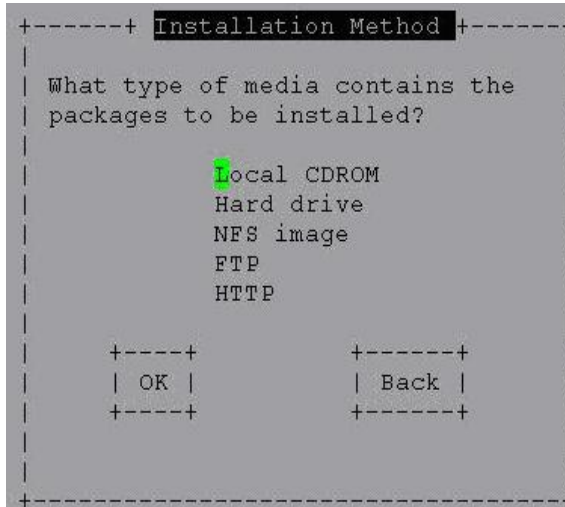
```
CLIENT MAC ADDR: 00 80 42 2C 66 AE  GUID: 00020003 0004 0005 0006 000700080009
DHCP...-                               .168.21.1
TFTP.                                70
UNDI code segment size: 4580
My IP address seems to be COA81576 192.168.21.118
ip=192.168.21.118:192.168.21.1:0.0.0.0:255.255.255.0
Trying to load: pxelinux.cfg/00020003-0004-0005-0006-000700080009
Trying to load: pxelinux.cfg/00A81576
Trying to load: pxelinux.cfg/COA8157
Trying to load: pxelinux.cfg/COA815
Trying to load: pxelinux.cfg/COA81
Trying to load: pxelinux.cfg/COA8
Trying to load: pxelinux.cfg/COA
Trying to load: pxelinux.cfg/CO
Trying to load: pxelinux.cfg/C
Trying to load: pxelinux.cfg/default
Loading vmLinux.....
Loading initrd.img.....
.....Ready.
```

3. In **Choose a Language** window, select preferred language and press **<Enter>**.

```
Welcome to Red Hat Enterprise Linux Server

+-----+ Choose a Language +-----+
|                                     |
| What language would you like to use |
| during the installation process?    |
|                                     |
|          Catalan                    ^ |
|          Chinese(Simplified)        : |
|          Chinese(Traditional)       # |
|          Croatian                    : |
|          Czech                      : |
|          Danish                     : |
|          Dutch                      : |
|          English                     v |
|                                     |
|                                     +----+ |
|                                     | OK | |
|                                     +----+ |
|                                     |
+-----+
```

4. In **Installation Method** window, select **NFS image**, **FTP**, or **HTTP** installation method depending upon the setup and press **<Enter>**.



5. **Networking Device** window is displayed. Select network devices using the following:

- Select 1st network interface corresponding to Intel Ethernet Chipset 82576, if DHCP server configured in step 3 of page 62, [Installation Setup](#) is accessible via the ATCA controller blade of logical slot 1 of ATCA Chassis.
- Select 2nd network interface corresponding to Intel Ethernet Chipset 82576, if DHCP server configured in step 3 of page 62, [Installation Setup](#) is accessible via the ATCA controller blade of logical slot 2 of ATCA Chassis.
- Select network interface corresponding to Intel Ethernet Chipset 82567LM-2, if DHCP server configured in step 3 of page 62, [Installation Setup](#) is accessible via front panel interface of the blade.

After selecting network interface to be used for installation, press **<Enter>**.

```
Welcome to Red Hat Enterprise Linux Server

+-----+ Networking Device +-----+
|
| You have multiple network devices on this system. Which would
| you like to install through?
|
| eth0 - Intel Corporation 82567LM-2 Gigabit Network Connection
| eth1 - Intel Corporation 82572EI Gigabit Ethernet Controller
| eth2 - Intel Corporation 82576 Gigabit Network Connection
| eth3 - Intel Corporation 82576 Gigabit Network Connection
| eth4 - Intel Corporation 82599EB 10-Gigabit Dual Port Network Connection
| eth5 - Intel Corporation 82599EB 10-Gigabit Dual Port Network Connection
|
|          +----+          +-----+          +-----+
|          | OK |          | Identify |          | Back |
|          +----+          +-----+          +-----+
|
+-----+

<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen
```

6. Configure Ethernet interface according to network configuration of the organization, then select **OK** and press **<Enter>**.

```
+-----+ Configure TCP/IP +-----+
|
| [*] Enable IPv4 support
|      (*) Dynamic IP configuration (DHCP)
|      ( ) Manual configuration
|
| [*] Enable IPv6 support
|      (*) Automatic neighbor discovery (RFC 2461)
|      ( ) Dynamic IP configuration (DHCP)
|      ( ) Manual configuration
|
|          +----+          +-----+
|          | OK |          | Back |
|          +----+          +-----+
|
+-----+
```

7. Enter server name NFS, FTP, or HTTP and RHEL installation directory depending upon the installation method entered in step 4 on page 69.
 For example, if you have selected **NFS image** as installation method in step 4 then first enter NFS server name, RHEL server directory as configured in step 1 under [Installation Setup](#) and mount option for NFS image, select **OK** and press **<Enter>**.
 For more information, refer sections 4.7, 4.8 and 4.9 of *RHEL installation guide* located at http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/index.html

```

+-----+ NFS Setup +-----+
|
| Please enter the following information:
|
|   o the name or IP number of your NFS server
|   o the directory on that server containing
|     Red Hat Enterprise Linux Server for your architecture
|   o optionally, parameters for the NFS mount
|
| NFS server name: _____
| Red Hat Enterprise Linux Server directory: _____
| NFS mount options (optional): _____
|
|           +----+           +-----+
|           | OK |           | Back |
|           +----+           +-----+
|
+-----+

```

8. If you want to do installation in graphical mode using VNC then select **Start VNC**, press **<Enter>**, and then follow steps 10 through 25 of [Graphical Mode Installation](#).
 Otherwise select **User text mode** method to install RHEL in text mode over serial console, press **<Enter>**, and then follow steps 9 through 23 of [Text Mode Installation](#).

```

+-----+ Would you like to use VNC? +-----+
|
| The VNC mode installation offers more
| functionality than the text mode, would
| you like to use it instead?
|
|           +-----+           +-----+
|           | Use text mode | | Start VNC |
|           +-----+           +-----+

```

9. When the following window is displayed, press **<F2>** or **<Del>** key to enter into BIOS menu.

Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc
Press <DEL> or <F2> to enter setup.

When **<F2>** or **<Del>** key is pressed, BIOS window is visible on serial console.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
BIOS Information
Board Name      Emerson ATCA-7367
BIOS Version    1.0.3
Build Date      07/13/2010 09:26:42

Board Information
Current System   Standard
FPGA Version     4
Boot Flash Selection Bank B (IPMI)

Memory Information
Total Memory     8192 MB (DDR3)

System Date      [Wed 09/08/2010]
System Time      [10:56:20]

Access Level     Administrator

6:08
-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

10. Select **BOOT** menu.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
| Boot Configuration                                ^|Sets the system boot |
|> Option ROM Execution                            *|order              |
|                                                    *|                  |
| Spread Spectrum suppo [Enabled]                  *|                  |
|                                                    *|                  |
| Wait AMC/RTM Timeout 0                            *|                  |
| Wait AMC/RTM Policy [Auto]                       *|                  |
|                                                    *|                  |
| Setup Prompt Timeout 5                           *|                  |
| Bootup NumLock State [On]                        *|                  |
|                                                    *|><: Select Screen  |
| Boot Option Priorities                          *|^v: Select Item     |
| Boot Option #1 [Base Network 1]                *|Enter: Select      |
| Boot Option #2 [SAS ID00 LUN0 ATA ...]            *|+/-: Change Opt.   |
| Boot Option #3 [Disabled]                        *|F1: General Help   |
| Boot Option #4 [Disabled]                        *|F2: Previous Values|
| Boot Option #5 [Disabled]                        *|F3: Optimized Defaults|
| Boot Option #6 [Disabled]                        +|F4: Save ESC: Exit |
|                                                    v|                  |
|-----+-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

11. Select **Boot option #1** and press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
| Boot Configuration                                ^|Sets the system boot |
|> Option ROM Execution                            *|order              |
|                                                    *|                  |
| Spread Spectrum suppo [Enabled]                  *|                  |
|-----+----- Boot Option #1 -----\
| Wait AMC/RTM Timeout| Onboard-USBFloppy SMART eUSB 87 |
| Wait AMC/RTM Policy| USB1:USB CDROM SONY DVD RW DRX-S |
|                    | SAS ID00 LUN0 ATA ST980818SM |
| Setup Prompt Timeout| Base Network 1 |
| Bootup NumLock Stat| Base Network 2 |
|                    | FrontPanel Network |
| Boot Option Priorit| UEFI: Built-in EFI Shell |
| Boot Option #1 | Disabled |
| Boot Option #2 |-----+-----\ Change Opt.
| Boot Option #3 |                    |
| Boot Option #4 [Disabled] *|F2: Previous Values |
| Boot Option #5 [Disabled] *|F3: Optimized Defaults|
| Boot Option #6 [Disabled] +|F4: Save ESC: Exit |
|                            v|                  |
|-----+-----
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```

12. Select **hard disk** and press **<Enter>**. In the screenshot the hard disk is **ID00 LUN0**, but name of hard disk may vary depending upon type of RTM-ATCA-7360.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Boot Configuration                               ^|Sets the system boot
|> Option ROM Execution                           *|order
|                                                  *|
| Spread Spectrum suppo [Enabled]                 *|
|                                                  |
| /----- Boot Option #1 -----\
| Wait AMC/RTM Timeou| Onboard-USBFloppy SMART eUSB 87 | |
| Wait AMC/RTM Policy| USB1:USB CDROM SONY DVD RW DRX-S |
|                    | SAS ID00 LUN0 ATA ST980818SM |
| Setup Prompt Timeou| Base Network 1                 |
| Bootup NumLock Stat| Base Network 2                 |
|                    | FrontPanel Network              |
| Boot Option Priorit| UEFI: Built-in EFI Shell         |
| Boot Option #1    | Disabled                        |
| Boot Option #2     | \-----/ Change Opt.          |
| Boot Option #3     |                      General Help          |
| Boot Option #4     | [Disabled] *|F2: Previous Values          |
| Boot Option #5     | [Disabled] *|F3: Optimized Defaults        |
| Boot Option #6     | [Disabled] +|F4: Save ESC: Exit          |
|                    | v|
|-----
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

When **<Enter>** is pressed, **Boot option #1** changes to hard disk.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----
| Boot Configuration                                ^|Sets the system boot
|> Option ROM Execution                            *|order
|                                                    *|
| Spread Spectrum suppo [Enabled]                  *|
|                                                    *|
| Wait AMC/RTM Timeout 0                            *|
| Wait AMC/RTM Policy [Auto]                        *|
|                                                    *|
| Setup Prompt Timeout 5                            *|
| Bootup NumLock State [On]                         *|
|                                                    *|><: Select Screen
| Boot Option Priorities                           *|^v: Select Item
| Boot Option #1 [SAS ID00 LUN0 ATA ...]          *|Enter: Select
| Boot Option #2 [Base Network 1]                   *|+/-: Change Opt.
| Boot Option #3 [Disabled]                          *|F1: General Help
| Boot Option #4 [Disabled]                          *|F2: Previous Values
| Boot Option #5 [Disabled]                          *|F3: Optimized Defaults
| Boot Option #6 [Disabled]                          +|F4: Save ESC: Exit
|                                                    v|
|-----+-----|
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

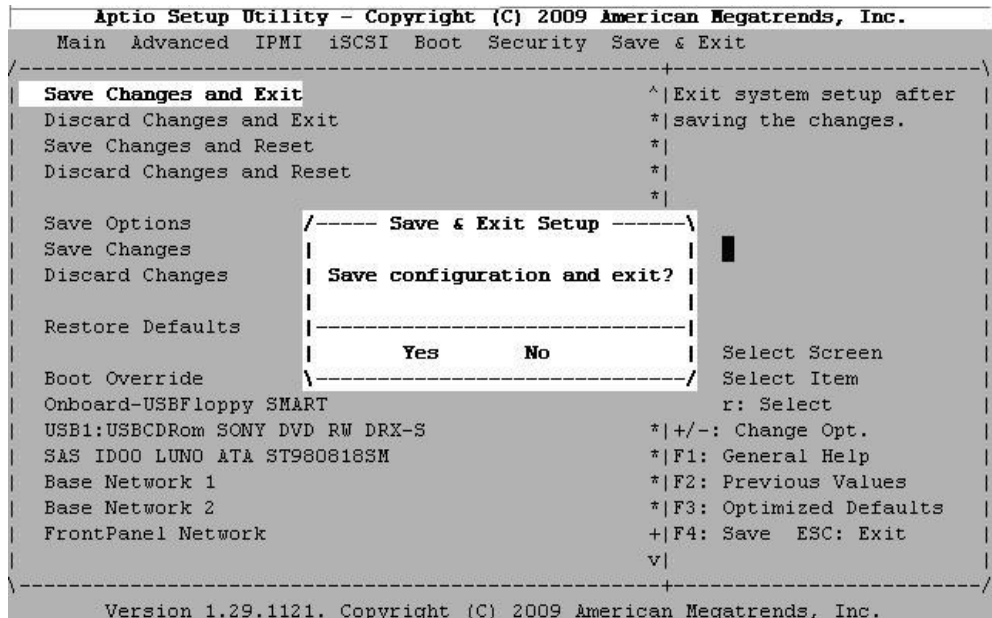
13. Go to **Save & Exit** tab, select **Save Changes and Exit** and then press **<Enter>**.

```

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced IPMI iSCSI Boot Security Save & Exit
-----+-----
| Save Changes and Exit                                ^|Exit system setup after |
| Discard Changes and Exit                             *|saving the changes.   |
| Save Changes and Reset                               *|                     |
| Discard Changes and Reset                             *|                     |
|                                                         *|                     |
| Save Options                                          *|                     |
| Save Changes                                          *|                     |
| Discard Changes                                       *|                     |
|                                                         *|                     |
| Restore Defaults                                     *|                     |
|                                                         *|                     |
| Boot Override                                        *|><: Select Screen     |
| Onboard-USBFloppy SMART eUSB 87                     *|^v: Select Item       |
| USB1:USB CDROM SONY DVD RW DRX-S                    *|Enter: Select        |
| SAS ID00 LUN0 ATA ST980818SM                        *|+/-: Change Opt.     |
| Base Network 1                                       *|F1: General Help     |
| Base Network 2                                       *|F2: Previous Values  |
| FrontPanel Network                                  *|F3: Optimized Defaults|
|                                                         +|F4: Save  ESC: Exit   |
|                                                         v|                     |
|-----+-----|
Version 1.29.1121. Copyright (C) 2009 American Megatrends, Inc.

```

14. Select **Yes** and press **<Enter>**. The system exits from BIOS.



15. As system boots up with RHEL, **Setup Agent** utility is displayed. Configure the system, and select **Exit** and then press **<Enter>** to continue to boot up the blade.
16. As system boots up login prompt is shown, enter user name as **root** and password to login to system using root account.
17. Register the blade with Red Hat Network using guidelines given at <https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

Hypervisor Support

3.1 Overview

A hypervisor, also called virtual machine manager, is a piece of software or hardware platform virtualization that allows multiple operating systems to run on a host computer concurrently. The ATCA-7367 blade supports Xen and KVM hypervisor.

Following sections describes the method to install Xen and KVM hypervisor on the ATCA-7367 blade.

3.2 Installation of Xen Hypervisor

Xen hypervisor is the fastest and most secure infrastructure virtualization solution available today, supporting a wide range of guest operating systems including Windows®, Linux®, Solaris®, and various versions of the BSD operating systems.

With Xen virtualization, a thin software layer known as the Xen hypervisor is inserted between the server hardware and the operating system. This provides an abstraction layer that allows each physical server to run one or more virtual servers, effectively decoupling the operating system and its applications from the underlying physical server.

3.2.1 Prerequisites

Following are the prerequisites for installing Xen hypervisor on the ATCA-7367 blade:

- RHEL 5 update 6 (or any further update) server edition is installed on the blade.
- The blade is connected with Red Hat Network, if not then register the blade with Red Hat Network using guidelines given at:
<https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

3.2.2 Installation Procedure

Procedure

Perform the following steps for installation of Xen hypervisor using **yum**:

1. Connect serial console cable to the front panel of the blade and access serial console using the following settings.
 - baud rate: 9600
 - data bits: 8
 - parity: none
 - stop bit: 1
 - hardware control: none
2. Login on the blade using root account.
3. Start installation of Xen kernel.
#yum install kernel-xen
4. You are prompted to enter **y/N**, press **y** to continue installation of Xen kernel.

```
[root@localhost ~]# yum install kernel-xen
Loaded plugins: rhnplugin, security
Setting up Install Process
Resolving Dependencies
--> Running transaction check
--> Package kernel-xen.1686 0:2.6.18-164.11.1.el5 set to be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                Arch                Version              Repository
=====
Installing:
kernel-xen              i686                2.6.18-164.11.1.el5  rhel-1386-server-5

Transaction Summary
=====
Install      1 Package(s)
Update      0 Package(s)
Remove      0 Package(s)

Total download size: 17 M
Is this ok [y/N]: y
```

Installation of Xen kernel starts.

```
[root@localhost ~]# yum install kernel-xen
Loaded plugins: rhnplugin, security
Setting up Install Process
Resolving Dependencies
--> Running transaction check
--> Package kernel-xen-1686 0:2.6.18-164.11.1.el5 set to be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package Arch Version Repository
=====
Installing:
kernel-xen 1686 2.6.18-164.11.1.el5 rhel-1386-server-5

Transaction Summary
=====
Install 1 Package(s)
Update 0 Package(s)
Remove 0 Package(s)

Total download size: 17 M
Is this ok [y/N]: y
Downloading Packages:
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 0.0 B/s | 2.2 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 3.2 kB/s | 2.2 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 6.9 kB/s | 2.3 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 6.7 kB/s | 2.3 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 11 kB/s | 2.3 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 12 kB/s | 2.3 MB
kernel-xen-2.6.18-164.11.1.el5.1686.rpm 13% [*****] 15 kB/s | 2.3 MB
```

5. When installation of Xen kernel is completed, **Complete!** message is displayed.

```
Transaction Summary
=====
Install      1 Package(s)
Update       0 Package(s)
Remove       0 Package(s)

Total download size: 17 M
Is this ok [y/N]: y
Downloading Packages:
kernel-x | 17 MB
Running rpm_check_debug
Running Transaction Test
Finished Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing      : kernel-xen                                1/1

Installed:
  kernel-xen.i686 0:2.6.18-164.15.1.el5

Complete!
[root@localhost fcutils]#
```

6. Edit Xen kernel entry of `/etc/grub.conf` file to add serial console settings.

Xen kernel entry may look like as below:

```
title Red Hat Enterprise Linux Server (2.6.18-164.el5xen)
root (hd0,0)

kernel /xen.gz-2.6.18-164.el5 com1=9600,8n1

module /vmlinuz-2.6.18-164.el5xen ro

root=/dev/VolGroup00/LogVol02 console=ttyS0,9600n8 rhgb quiet

module /initrd-2.6.18-164.el5xen.img
```

7. Reboot system.

#reboot

```

kernel-xen-2.6.18-164.11.1.el5.i686.rpm          99% [=====] 18 kB/s | 17 MB
kernel-xen-2.6.18-164.11.1.el5.i686.rpm          99% [=====] 18 kB/s | 17 MB
kernel-xen-2.6.18-164.11.1.el5.i686.rpm          99% [=====] 19 kB/s | 17 MB
kernel-xen-2.6.18-164.11.1.el5.i686.rpm          99% [=====] 19 kB/s | 17 MB
kernel-xen-2.6.18-164.11.1.el5.i686.rpm          99% [=====] 19 kB/s | 17 MB
Running rpm_check_debug
Running Transaction Test
Finished Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing      : kernel-xen

Installed:
  kernel-xen.i686 0:2.6.18-164.11.1.el5

Complete!
[root@localhost ~]# reboot

```

8. When system comes up after reboot, select Xen kernel entry in grub menu to boot system with Xen kernel.

3.3 Installation of KVM Hypervisor

KVM (Kernel-based Virtual Machine) is a full virtualization solution for Linux on x86 hardware containing virtualization extensions Intel VT or AMD-V. It consists of a loadable kernel module `kvm.ko` that provides the core virtualization infrastructure and a processor specific module, `kvm-intel.ko`, or `kvm-amd.ko`.

Using KVM, one can run multiple virtual machines running unmodified Linux or Windows images. Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, etc.

3.3.1 Prerequisites

Following are the prerequisites for installing KVM hypervisor on the ATCA-7367 blade:

- 64bit RHEL 5 update 6 (or any further update) Server Edition is installed on the blade.
- The blade is connected with Red Hat Network, if not then register the blade with Red Hat Network using guidelines given at:

<https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

3.3.2 Installation Procedure

Procedure

Perform following steps for installation of KVM hypervisor using **yum**.

1. Follow the steps 1 through 2 described in *Installation Procedure on page 80*.
2. Start installation of KVM hypervisor.
#yum install kvm
3. You are prompted to enter **y/N**, press **y** to install KVM hypervisor.

```
[root@localhost ~]# yum install kvm
Loaded plugins: rhnplugin, security
Setting up Install Process
Resolving Dependencies
--> Running transaction check
---> Package kvm.x86_64 0:83-105.el5_4.22 set to be updated
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package Arch Version Repository Size
=====
Installing:
kvm x86_64 83-105.el5_4.22 rhel-x86_64-server-vt-5 836 k

Transaction Summary
=====
Install 1 Package(s)
Update 0 Package(s)
Remove 0 Package(s)

Total download size: 836 k
Is this ok [y/N]: y
```

4. When KVM hypervisor installation is completed, **Complete!** message is displayed.

```
Total download size: 836 k
Is this ok [y/N]: y
Downloading Packages:
kvm-83-1 | 656 kB
Running rpm_check_debug
Running Transaction Test
Finished Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing      : kvm                                1/1

Installed:
kvm.x86_64 0:83-105.el5_4.22

Complete!
[root@localhost ~]#
```

3.4 Virtualized Guest Installation

After installation of Xen or KVM hypervisor on the blade, you can create guest operating systems. This section describes the general processes for installing guest operating systems on virtual machines.

3.4.1 Prerequisites

Following are the prerequisites for virtualized guest installation:

- RHEL 5 update 6 (or any further update) Server Edition is installed with Xen and KVM hypervisor as described in [Installation of Xen Hypervisor](#) and [Installation of KVM Hypervisor](#).
- VNC server is installed.
- The blade is connected with Red Hat Network, if not then register the blade with Red Hat Network using guidelines given at <https://rhn.redhat.com/rhn/help/reference/rhn500/en/s1-registration-yum.jsp>

3.4.2 Installation Procedure

Procedure

You need to perform following steps to install virtualized guest operating system:

1. Follow the steps 1 through 2 described in [Installation Procedure on page 80](#).
2. Configure VNC server on the blade using the following steps.

1. Open and edit `/etc/sysconfig/vncservers` file, to allow VNC access to root user.

For example, file `/etc/sysconfig/vncservers` should look like:

```
VNCSERVERS="2:root"
```

```
VNCSERVERARGS[2]="-geometry 1024x768"
```

2. Open and edit `~/.vnc/xstartup` file, to initialize X session whenever you login on the blade using VNC viewer.

For example, `~/.vnc/xstartup` file may look like as below:

```
#!/bin/sh
```

```
# Uncomment the following two lines for normal desktop:
```

```
unset SESSION_MANAGER
```

```
exec /etc/X11/xinit/xinitrc
```

```
[ -x /etc/vnc/xstartup ] && exec /etc/vnc/xstartup
```

```
[ -r $HOME/.Xresources ] && xrdp $HOME/.Xresources
```

```
xsetroot -solid grey
```

```
vncconfig -iconic &
```

```
#xterm -geometry 80x24+10+10 -ls -title "$VNCDESKTOP Desktop" &
```

```
#twm &
```

```
startx &
```

3. Allow VNC based access using password authentication mechanism.
#vncpasswd
4. Start VNC server.
#!/etc/init.d/vncserver start
3. Install virtual manager and Xen utilities.
#yum install xen virt-manager
4. Start Xen service.
#!/etc/init.d/xend start
5. Disable firewall on system using following command, or configure iptables rules to enable VNC access.
#!/etc/init.d/iptables stop
6. Connect to the blade using VNC viewer. While connecting, you are prompted to enter <IP address>:<display# >.
Where <IP address> is IP address of the blade, and <display#> is display number in /etc/sysconfig/vncservers. For example, assuming IP address of front interface is 192.168.10.8 and /etc/sysconfig/vncservers is edited as in step 2, you need to enter 192.168.10.8:2 while connecting using VNC viewer.
7. Create virtualized guest using guidelines given under *Section 6.2 of RHEL Virtualization Guide* located at:
http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5.5/html/Virtualization_Guide/sect-Virtualization-Virtualized_guest_installation_overview-Creating_guests_with_virt_manager.html

Utilities Package

4.1 Overview

The Utilities Package (UP) for RHEL includes the following components:

- Service Initialization Scripts
- Board Control Module (BCM)
- Firmware Upgrade Facility (FUF)
- Clock Agent Command Module
- HPM Agent Command Module
- Enhanced ipmitool (ipmitool_pps)
- SFMEM Support Module
- Igb-ixgbe: drivers for Intel 82576 (igb-3.0.22) and 82599 (ixgbe- 2.0.72.4-NAPI) network interfaces

4.2 Package Information

UP software is delivered as a tgz file. For RHEL 5 update 6, the following packages support the different kernel release.

Table 4-1 Packages of UP for RHEL5.6

Package name	Description
bsp-<version>.x86_64-rhel56-2.6.18-238.el5-linux.tgz	For x86_64 arch with kernel 2.6.18-238.el5
bsp-<version>.x86_64-rhel56-xen-2.6.18-238.el5-linux.tgz	For x86_64 arch with kernel xen-2.6.18-238.el5

4.3 Installation Procedures

4.3.1 Extracting the Package

To extract the package, execute the shell command **tar**.

```
# tar -xvf bsp-<version>.x86_64-rhel56-2.6.18-238.el5-linux.tgz
# cd bsp-<version>.x86_64-rhel56-2.6.18-238.el5-linux
```



You must choose the correct UP package according to your kernel release and kernel arch.

Execute the shell command **uname** to get your kernel information:

```
# uname -rm
2.6.18-238.el5 x86_64
```

After extracting the package, `bsp-<version>.x86_64-rhel56-2.6.18-238.el5-linux` directory will be created which contains the following subdirectories and files:

- `up_install.sh`: installation shell script
- `ChangeLog`: UP version information file
- `README`: usage introduction of the UP
- `etc`: init scripts of the UP
- `rpms`: rpm packages of UP
- `rom`: rpm packages of firmware
- `bin`: executable binary files

4.3.2 Installing the UP

To install UP, execute the shell script `up_install.sh`.

The script triggers an install wizard, that guides you to make the installation step by step.

```
# ./ up_install.sh

===== Welcome to ATCA-7367 RedHat EL 5.5 UP installation guide =====

Continue? [Y/N, default is Y]: Y
```

The installation will install the following MUST packages into your system:

1. BoardCtrl
2. Service Initialization Scripts
3. FUF-Firmware Upgrade Facility
4. SFMEM support Module
5. Clock Agent Command Module
6. HPM Agent Command Module
7. Enhanced ipmitool(ipmitool_pps)

Install the optional igb driver for onboard Intel 82576 1Gb ethernet network controller? [Y/N, default is N]:Y

Install the optional ixgbe driver for onboard Intel 82599 10Gb ethernet network controller? [Y/N, default is N]:Y

The following packages are to be installed:

BoardCtrl

Service Initialization Scripts

FUF-Firmware Upgrade Facility

SFMEM support Module

Clock Agent Command Module

HPM Agent Command Module

Enhanced ipmitool(ipmitool_pps)

igb driver

ixgbe driver

Continue? [Y/N/B, B means go back, default Y]: Y

Begins to install.....

Begins to install boardctrl, scripts, FUF.....

```

Preparing... ##### [100%]
  1:bbs-fuf ##### [100%]
Preparing... ##### [100%]
  1:bbs-flashrom ##### [100%]
Preparing... ##### [100%]
  1:bbs-boardctrl ##### [100%]
Preparing... ##### [100%]
  1:bbs-artm-atca7360 ##### [100%]

```

.....

Finished to install boardctrl, scripts, FUF

Begins to install igb driver.....

```

Preparing... ##### [100%]
  1:bbs-igb_ixgbe ##### [100%]

```

Finished to install igb driver

Begins to install ixgbe driver.....

Finished to install ixgbe driver

Run up for installation.....

Begins to restart network.....

Finished to restart network.....

Installation completed!

After completing the installation, you should run **export** to add /opt/bladeservices/bin to the PATH and add /opt/bladeservices/usr/lib to the LD_LIBRARY_PATH, or logout and login again.

```
# export PATH=$PATH: /opt/bladeservices/bin
```

```
# export
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/bladeservices/usr/lib
```



If you choose to install the igb or ixgbe component, the onboard Intel 82576 and 82599 network interfaces services will be restarted.

4.3.3 Uninstalling the UP

To uninstall the installed UP in your blade, execute the shell command `up_uninstall`.

```
# up_uninstall
```

```
===== Welcome to ATCA-7367 RedHat EL 5.5 UP uninstallation guide =====
```

```
Continue? [Y/N, default is Y]: Y
```

NOTICE: the following installed components will be uninstalled:

1. BoardCtrl
2. Service Initialization Scripts
3. FUF-Firmware Upgrade Facility
4. SFMEM support Module
5. Clock Agent Command Module
6. HPM Agent Command Module
7. Enhanced ipmitool(ipmitool_pps)
8. igb driver
9. ixgbe driver

The following packages are to be uninstalled:

BoardCtrl

Service Initialization Scripts

FUF-Firmware Upgrade Facility

SFMEM support Module

Clock Agent Command Module

HPM Agent Command Module

Enhanced ipmitool(ipmitool_pps)

igb driver

ixgbe driver

Continue? [Y/N/B, B means go back, default Y]: Y

Begins to uninstall.....

Begins to uninstall boardctrl, scripts, FUF.....

Finished to uninstall boardctrl, scripts, FUF

Begins to uninstall igb driver.....

Finished to uninstall igb driver

Begins to uninstall ixgbe driver.....

Finished to uninstall ixgbe driver

Run up for uninstallation.....

Begins to restart network.....

Finished to restart network.....

Uninstallation completed!

4.3.4 Reinstalling the UP

To reinstall UP, execute the install script `up_install.sh` in the new package directly.



The script automatically uninstalls any installed version of UP components before making the new installation.

```
# ./up_install.sh
```

```
Installed UP detected!
```

```
Uninstall it and make a new installation? [Y/N, default is N]:Y
```

```
Uninstall.....
```

```
(automatically uninstall)
```

```
Make a new installation.....
```

The installation will install the following MUST packages into your system:

1. BoardCtrl
2. Service Initialization Scripts
3. FUF-Firmware Upgrade Facility
4. SFMEM support Module
5. Clock Agent Command Module
6. HPM Agent Command Moudle
7. Enhanced ipmitool(ipmitool_pps)

```
Install the optional igb driver for onboard Intel 82576 1Gb ethernet network controller? [Y/N, default is N]:
```

```
.....
```

4.4 Service Initialization Scripts

4.4.1 RC Scripts

In addition to the rc-scripts of RHEL 5 update 6, the following start/stop scripts are added to ATCA-7367.

Table 4-2 RC Scripts

Run Level	Script Name	Description
rc3.d	S02bbsinit.sh	Starts board ctrl driver, ipmi drivers, sfmem driver
	S09ledservicectrl.sh	Front panel LED OOS/IS operation
	S22osbootsensor.sh	OS boot status sensor value updating to IPMC
rc0.d	K02bbsinit.sh	Stop the board ctrl driver and sfmem driver
	K09ledservicectrl.sh	Front panel LED OOS/IS operation

4.5 Board Control Module

4.5.1 Overview

Board control is a kernel module which provides access to the board FPGA. The board control module creates a boardinfo directory in the `/proc` file system that contains general information on the ATCA-7367. The following table describes the information in boardinfo directory.

File	Description	Sample output
<code>bios_releasedate</code>	Shows the release date of the currently installed BIOS.	12/09/2009
<code>board_name</code>	Shows the board name, as provided by the BIOS.	ATCA - 7367
<code>board_version</code>	Shows the board version, as provided by the BIOS.	0106865F01A

File	Description	Sample output
bios_version	Shows the BIOS version.	1.0.0
board_serialnumber	Shows the serial number of the board, as provided by the BIOS.	ENG00177
fpga	Shows additional FPGA information.	FPGA version: 0x0B . . .
summary	Shows a summary of the board state (FPGA registers) and BIOS provided information.	Board Vendor: Emerson Board Name: ATCA-7367 Board Version: 0106865F01A.... Board Serial Number: ENG00177.... BIOS Vendor: Emerson BIOS Version: 0.0.25G BETA BIOS Release Date: 12/09/2009 Last Reset Source: PowerOn CPU IPMI Cold Reset Memory Module: Device/Bank: DIMM_Socket_P01/Node0_Channel0_Dimm0 Size: 2048 Mbyte Data Width: 64 Bit Manufacturer: A1_Manufacturer0 Memory Module: Device/Bank: DIMM_Socket_P11/Node1_Channel0_Dimm0 Size: 2048 Mbyte Data Width: 64 Bit Manufacturer: A2_Manufacturer0 IPMI Interface Type: 1 KCS (Keyboard Control Style) IPMI Spec Rev: 2.0 I2C Slave Addr: 0x9A NV Stor.Dev.Addr: Not Present Base Addr: 0x00000CA3 IRQ: 0x0

4.5.2 Board Control Tool

The board control module provides an IOCTL interface which can be used by the userland applications. The following sections describe userland applications, such as LEDCTRL and FPGA_TEST.

4.5.2.1 LEDCTRL

Description

Allows to control the 3 front panel LEDs, according to their capabilities.

LEDCTRL can be found at `/opt/bladeservices/bin/ledctl`.

Synopsis

```
ledctl [options] [led1] [led2] ...
```

Here, `led<n>` are zero-based LED numbers. If no LED numbers are given, the option is applied to all the available LEDs.

The options can have the following values.

Option	Description
-n	Print number of available LEDs.
-i	Display information about LED capabilities.
-s	Print current LED settings.
-c <color>	Set LED(s) <color> to: g[reen], y[ellow], r[ed], b[lue], a[mber], hdd, or eth.
-b <freq>	Set blink frequency to: off or p[ermanent].

4.5.2.2 FPGA_TEST

Description

Dumps the FPGA register set. FPGA_TEST can be found at `/opt/bladeservices/bin/fpga_test`.

Synopsis

```
fpga_test -d
```

Here, -d option is used to dump the complete FPGA register set.

4.6 Firmware Upgrade Facility

4.6.1 Overview

The Firmware Upgrade Facility (FUF) provides a uniform way to upgrade firmware on Artesyn hub blades and node blades. It consists of a Firmware Upgrade Command-line Utility (FCU), flash device drivers, and specially prepared firmware recovery image files.

Using FUF, the following firmware types can be upgraded on the ATCA-7367:

- Basic Input/output System (BIOS) firmware
- Intelligent Platform Management Controller (IPMC) firmware
- Module Management Controller (MMC) firmware on RTM
- Field Programmable Gate Array (FPGA) image

4.6.2 Firmware Recovery Image Files

FCU supports specially prepared firmware recovery image (FRI) files and firmware images in the HPM.1 format. HPM.1 is a PICMG standard to upgrade IPMC.

By default, the image files for the current hardware configurations are loaded as part of the UP software in `/opt/bladeservices/rom` when the Utilities Package is installed.

The following image files are currently supported.

Table 4-3 Image Files

Filename	Description
<code>atca-7367-cpu-<version>.fri</code>	BIOS image for ATCA-7367 with FRI format
<code>atca-7367-cpu-<version>.hpm</code>	BIOS image for ATCA-7367 with HPM.1 format

Table 4-3 Image Files

Filename	Description
atca-7367-c01-ipmc.hpm	IPMC firmware for ATCA-7367 variant of ATCA-7367-C01
atca-7367-amc-poped-ipmc.hpm	IPMC firmware for ATCA-7367 variants with AMC Bay populated (Including ATCA-7367-0GB, ATCA-7367-12GB, ATCA-7367-24GB).
atca-7367-amc-no-poped-ipmc.hpm	IPMC firmware for ATCA-7367 variants with NO AMC Bay populated (Including ATCA-7367-0GBLS, ATCA-7367-12GB-LS).
atca-7367-ipmc-c01-boot.hpm	IPMC boot loader for ATCA-7367 variant of ATCA-7367-C01
atca-7367-ipmc-amc-poped-boot.hpm	IPMC boot loader for ATCA-7367 variants with AMC Bay populated (Including ATCA-7367-0GB, ATCA-7367-12GB, ATCA-7367-24GB).
atca-7367-ipmc-amc-nopoped-boot.hpm	IPMC boot loader for ATCA-7367 variants with NO AMC Bay populated (Including ATCA-7367-0GBLS, ATCA-7367-12GB-LS).
atca-7367-fpga-<version>.bin	FPGA image in HPM.1 format
artm-7360-ipmc.hpm	IPMC Firmware for ARTM
artm-7360-ipmc-boot.hpm	IPMC boot loader for ARTM

4.6.3 Backup Concept

The BIOS firmware for the ATCA-7367 is stored in redundant and persistent memory devices. This allows the firmware image in one bank to serve as a backup for the other bank. This is particularly useful for firmware upgrades.

During normal operation, the CPU on the ATCA-7367 blade determines which bank to boot, based on a chip select signal controlled by the IPMC. This bank is considered the active boot device. FCU will only allow you to upgrade an inactive device. FUF allows to upgrade only the BIOS boot bank from which the blade has not booted. This means that you need to reboot the blade in case you want to upgrade both the banks of the BIOS flash. The BIOS firmware image can be programmed via the payload by using FUF or via IPMC.

The IPMC firmware consists of a boot loader as well as an active and a stand-by IPMI firmware. The boot loader maintains both the active and stand-by firmware in the flash memory of the ATCA-7367 blade.



Boot loader firmware is not installed in BBS by default, as the boot loader update must be performed on Artesyn request only.

Each time the IPMC firmware is upgraded, the most recent firmware version is kept in flash memory and the older firmware version is overwritten by the new one. Once the new IPMI firmware is programmed, the IPMC resets itself to boot from the new image. The boot loader validates the new IPMC firmware, provided the IPMC can power up successfully the current image is made active, and the previously active image is made backup. In case of power-up failures, the boot loader automatically recovers from crisis and boots from the previous image.

The FPGA bank can be updated via FCU or IPMC. This means that a corrupt FPGA can be restored using IPMC.

The following sample output displays the information regarding BIOS, IPMI, and FPGA. Depending on your setup, you may get a different output.

#fcu -q

```
*****[[[[[REPORT BEGIN]]]]*****
```

```
OPERATION : Query
```

```
RESULT    : SUCCESS
```

```
MESSAGE   : Device           : atca-7367-cpu
```

```
           Part number       : 0106865F08A....
```

```
           Part revision     : R1.2.
```

```
           BANK              : A
```

```
           Firmware Name     : AMI-BIOS
```

```
           Firmware Version   : 1.0.0
```

Marked for next use : no

--> Installed BIOS Version on Bank0

BANK : B

Firmware Name : AMI-BIOS

Firmware Version : 1.0.0

Marked for next use : yes

--> Installed BIOS Version on Bank1

OPERATION : Query

RESULT : SUCCESS

MESSAGE : Device : atca-7367-hpm.1-ipmc

Part number : 0106865F08A....

Part revision : R1.2.

BANK : A - Operational

Firmware Name : H8S-AMCc F/W

Firmware Version : 2.0.00000007

--> Installed IPMI FW on Bank0

BANK : B - Rollback

Firmware Name : H8S-AMCc F/W

Firmware Version : 2.0.00000007

--> Installed IPMI FW on Bank1

BANK : D - Operational

Firmware Name : H8S-AMCc B/L

Firmware Version : 2.0.00000006

--> Installed IPMI FW Boot Loader

BANK : G - Operational

Firmware Name : H8S-AMCc F/I

Firmware Version : 0.0.00000000

--> Internal IPMI Bank (FRU Info) No subject to be updated!

BANK : J - Operational

Firmware Name : H8S-AMCc F/C

Firmware Version : 0.0.00000000

--> Internal IPMI Bank (FRU Info Carrier) No subject to be updated

BANK : M - Operational

Firmware Name : FPGA

Firmware Version : 0.0.0000000D

--> Installed FPGA Version

BANK : P - Operational

Firmware Name : BIOS

Firmware Version : 1.0.00000000

--> Installed BIOS Version (seen by IPMC)

BANK : S - Operational

Firmware Name : BIOS

Firmware Version : 0.0.00000000

--> Second BIOS Bank (currently not seen by IPMC)

OPERATION : Query

RESULT : SUCCESS

MESSAGE : Device : artm-7367-hpm.1-ipmc

Part number : unknown

```

Part revision      : unknown
IPMI address      : MMC=0x72
    BANK           : A - Operational
    Firmware Name  : AVR-AMCm F/W
    Firmware Version : 1.51.00000002
--> Installed IPMI FW for ARTM on Bank1
    BANK           : B - Rollback
    Firmware Name  : AVR-AMCm F/W
    Firmware Version : 1.51.00000002
--> Installed IPMI FW for ARTM on Bank2
    BANK           : D - Operational
    Firmware Name  : AVR-AMCm B/L
    Firmware Version : 1.51.00000001
--> Installed IPMI Booter FW for ARTM
*****[[[[[ REPORT END ]]]]]*****

```

4.6.4 Firmware Upgrade Command-Line Utility

The Firmware Upgrade Command-line Utility (FCU) allows you to:

- Query the current versions of firmware installed on the blade and determine which firmware devices are active.
- Verify that a specified upgrade image is sound and compatible with the current hardware.
- Upgrade a firmware image.
- Mark a device to be used as the boot source on the next reset.
- Check the version of a specified firmware image file and compare the version of a specified firmware image file with the version of an installed firmware image.

FCU works in conjunction with device drivers created specifically for the flash devices on Artesyn blades.

For the FCU to verify and upgrade operations require specially prepared FRI files or HPM files, refer [Firmware Recovery Image Files on page 100](#).

Online help provided by FCU is as follows:

Synopsis

```
fcu --help
fcu --version
fcu -q [-d <device-id>]
fcu -v -f <filename>
fcu -u -f <filename>
fcu -a -f <filename>
fcu -m -b <bank-letter> -d <device-id>
```

Parameters

-a

--full-upgrade

This option is a shortcut for performing the verify, upgrade, and mark operations. The file option -f is required. This option should not be combined with other operations.

-b <bank-letter>

--bank=<bank-letter>

Specifies the bank to mark for next boot, where <bank-letter> is the letter designating a specific bank. For BIOS banks, possible values are A and B. For FPGA images, possible values are B (default EEPROM) and C (user-programmable EEPROM). This option is used with the mark operation. Use the query option -q to display available banks.

-c

--compare

Compares the image contained in the specified device with a specified file in the file system. This may be useful after an image upgrade to verify that the device actually contains a new and different image.

-d <device-id>**--device=<device-id>**

Specifies a target firmware device, where <device-id> is the name of the device. This option is used with the mark or query operations. Device ID values vary by hardware. You can display supported devices on a given blade or module by using `fcu --help`. Currently supported values are listed in the following table.

Device ID	Description
atca-7367-cpu	BIOS firmware image on ATCA-7367
atca-7367-hpm.1-ipmc	IPMC firmware, RTM MMC firmware and FPGA image on ATCA-7367

---file=<filename>

Specifies the FRI file, where <filename> is the complete path and filename of the image file. This option is used with verify and upgrade operations.

--force

This option allows the installation of images with non-matching part-number and part-revision FRU data fields. This option should be used with extreme caution, because installing an incompatible image on a device may render it inoperable.

--help

Displays a brief message describing command usage. It also displays a list of the devices supported on the blade or module. This option is exclusive and should not be used with other options.

This option needs a target destination -t argument added when working with the IPMC or ARTM.

-m

`--mark`

Tells FCU to set the boot select, so that on the next boot the specified firmware bank is active. When mark is combined with the upgrade operation, there is no need to specify a bank, the bank just upgraded is marked. Otherwise, you must specify a bank and a device.

Currently, the mark operation only supports CPU firmware devices.

`-q`

`--query`

Tells FCU to return firmware information for a specific device (if used with `-d`) or information about all firmware devices. The query operation is exclusive and is not intended to be combined with other operations.

`-s`

`show`

Shows detailed information about a specified file. The information shown include image type, version, manufacturer name etc. This command may be useful before a firmware upgrade to determine the version of a new image file.

`-u`

`--upgrade`

Tells FCU to upgrade the currently inactive bank of the device specified by the target FRI file. The file option `-f` is required. The upgrade operation may be combined with the verify and mark operations.

`-v`

`--verify`

Tells FCU to verify the image file specified by the required `-f` option. This operation verifies that the specified file is sound and compatible with the current hardware. The verify operation may be combined with the upgrade and mark operations.

`--version`

Displays version information for the utility. This option is exclusive and should not be used with other options.

Usage:

Some FCU options can be combined. Some options are exclusive. The following list describes the valid option combinations:

```
--compare --file=<filename>
--full-upgrade --file=<filename>
--help
--mark --bank=<bank-letter> --device=<device-id>
--query
--query --device=<device-id>
--show --file=<filename>
--upgrade --file=<filename>
--upgrade --mark --file=<filename>
--upgrade --file=<filename>
--verify --file=<filename>
--verify --upgrade --file=<filename>
--verify --upgrade --mark --file=<filename>
--version
```

Multi character options may be abbreviated so long as they are unique. For example, `--full` is equivalent to `--full-upgrade`. Typing `--ver`, however do not work since it matches both `verify` and `--version`.

Single character options may be combined without repeating the hyphen, as in these examples:

```
#fcu -vf /opt/bladeservices/rom/<filename>
```

```
#fcu -q -d <device-id>
```

```
#fcu -q -d <device-id>
```

```
#fcu -mb a -d <device-id>
```

Options are not case-sensitive. For example, `--help` is equivalent to `--HeLp`. However, option arguments, such as filename and device ID, are case-sensitive.

When upgrading firmware, it is strongly recommended that you upgrade only one device at a time. While FCU performs many checks during upgrade to ensure success, if something goes wrong and both firmware banks become corrupted and the blade will be inoperable.

4.6.5 Upgrading a Firmware Image

This section describes recommended procedures for upgrading firmware devices. The procedures for upgrading BIOS and IPMC differ slightly.

NOTICE

The upgrade fails if the following is not taken into consideration:

- Upgrade only one bank at a time, then reboot and verify the upgrade using the query option. If the upgrade fails and both banks become corrupted for any reason, the ATCA-7367 will be rendered inoperable.
- To prepare the ATCA-7367 for a BIOS upgrade, the dip-switches of the blade must be set such that all BIOS flashes are writable. This is the default configuration. Refer *ATCA-7367 Installation and Use Guide* for further details about dip switch settings.

4.6.5.1 Prerequisites

You should install the UP of ATCA-7367. All the firmware files are stored under `/opt/bladeservices/rom/`.

4.6.5.2 Upgrade Setup

Procedure

Perform following steps to create upgrade setup:

1. Connect serial console cable to the front panel of the blade and access serial console using the following settings.
 - baud rate: 9600
 - data bits: 8
 - parity: none
 - stop bit: 1
 - hardware control: none
2. Login on the blade using user name as root account.
3. Install OpenIPMI and OpenIPMI-libs package.
#yum install OpenIPMI OpenIPMI-libs

4.6.5.3 BIOS Firmware Upgrade

The BIOS can only be upgraded from the ATCA-7367 on which the BIOS is running. You can upgrade the BIOS by using fcu or with the ipmitool utility through shelf manager.

Upgrading the BIOS Firmware with FCU

Procedure

After installing the UP of ATCA-7367 and completing upgrade setup as described in [Upgrade Setup on page 111](#), perform following steps to upgrade BIOS firmware .

1. Query the current BIOS firmware images on the blade.
#fcu -qd atca-7367-cpu
2. Check the version of the new BIOS file.
**#fcu --show -f /opt/bladervices/rom/atca-7367-cpu-
 <version>.fri**
 or

```
fcu --show -f /opt/bladeservices/rom/atca-7367-cpu-  
<version>.hpm
```

3. Upgrade the firmware image.

```
#fcu --upgrade -f /opt/bladeservices/rom/atca-7367-cpu-  
<version>.fri
```

or

```
fcu --upgrade -f /opt/bladeservices/rom/atca-7367-cpu-  
<version>.hpm
```

FCU writes the new image and then reads back the image and performs a binary compare to ensure that the write was successful. If the upgrade was not successful, you will see an error message. Try the upgrade again, If it is not still successful contact your Artesyn representative.

4. Query the new image to ensure that the version information is correct.

```
#fcu -qd atca-7367-cpu
```

5. Mark the new image as active so that it can be used for the next boot.

```
#fcu --mark -b <bank-letter> -d atca-7367-cpu
```

where <bank - letter> is the letter of the upgraded bank, for example: a

6. Reboot the system.

```
#reboot
```

Upgrading the BIOS Firmware with IPMITool Utility through Shelf Manager

Procedure

Perform the following steps to upgrade BIOS Firmware using ipmitool utility through shelf manager.



The given file names and paths in the procedure are only meant as an example, and should be replaced with the file names and paths which are applicable to your configuration.

Before starting the BIOS upgrade, make sure that all of the DIP SW is at the factory default OFF status.

1. Install the blade into shelf, and wait until the hotswap blue LED is off.
2. Copy the HPM.1 BIOS image to your local machine which can access the shelf manager by IP.
3. Upgrade the HPM.1 BIOS image to ATCA-7367 through shelf manager.

Note that the bank switch must flash for both of the two banks.

Program the bank A as follows:

1. Switch Bank to bank A.

```
/usr/bin/ipmitool -I lan -H <Shelfmanager-IP-Address> -t blade's <ATCA-7367-IPMB-Address> -b 0x00 -A none raw 0x00 0x08 0x60 0x00 0x00
```
2. Flash the bank A.

```
/usr/bin/ipmitool -I lan -H <Shelfmanager-IP-Address> -t blade's <ATCA-7367-IPMB-Address> -b 0x00 hpm upgrade<BIOS_Image_File>.hpm activate
```

Program the bank B as follows:

1. Switch Bank to bank B.

```
/usr/bin/ipmitool -I lan -H <Shelfmanager-IP-Address> -t blade's <ATCA-7367-IPMB-Address> -b 0x00 -A none raw 0x00 0x08 0x60 0x00 0x01
```
2. Flash the bank B.

```
/usr/bin/ipmitool -I lan -H <Shelfmanager-IP-Address> -t blade's <ATCA-7367-IPMB-Address> -b 0x00 hpm upgrade <BIOS_Image_File>.hpm activate
```
4. Reset the blade, and the blade should be able to start with the above flashed BIOS images.

4.6.5.4 IPMC Firmware Upgrade

This section describes IPMC firmware upgrade procedure on the ATCA-7367 blade.



The general procedure to upgrade the MMC image of an RTM is same except that you need to use **artm-7360-hpm.1-ipmc** as device ID.

NOTICE

Make sure that you are updating ATCA-7367 with the correct IPMC firmware between **atca-7367-ipmc-amc-poped.hpm**, **atca-7367-ipmc-amc-nopoped.hpm** and **atca-7367-c01-ipmc.hpm**. Upgrading an invalid IPMC firmware to the ATCA-7367 blade may cause the blade malfunction. For more information, refer [Firmware Recovery Image Files on page 100](#).

Procedure

1. Query the current IPMC firmware images on the blade.

```
#fcu -q -d atca-7367-hpm.1-ipmc
```

2. Check the version of the new IPMC file.
#fcu --show -f /opt/bladeservices/rom/atca-7367-amc-poped-ipmc.hpm
3. Upgrade the firmware image.
#fcu --upgrade -f /opt/bladeservices/rom/atca-7367-amc-poped-ipmc.hpm
 Once the new IPMI firmware is programmed, the IPMC resets itself to boot from the new image. The boot loader validates the new IPMC firmware. Provided the IPMC can power up successfully the current image is made active and the previously active image is made backup. In case of power-up failures, the boot loader automatically recovers from crisis and boots from the previous image. IPMC mark operation is not supported.
4. Query the new image to ensure that the version information is correct.
#fcu -qd atca-7367-hpm.1-ipmc

If the version you just installed is now the active image, the upgrade was successful.

4.6.5.5 FPGA Firmware Upgrade

This section describes FPGA firmware upgrade procedure. The ATCA-7367 uses an EEPROM which contains the FPGA firmware.

Upgrading the FPGA Firmware with EEPROM

Procedure

Perform the following steps to upgrade the FPGA Firmware:

1. Query the current FPGA firmware images on the blade.
#fcu -q -d atca-7367-hpm.1-ipmc



The FCU tool reads the FPGA firmware version directly from the FPGA and not from the EEPROM. Therefore, you need to perform a blade power cycle before you can see the version of a newly installed FPGA firmware.

2. Check the version of the new FPGA file.
#fcu --show -f /opt/bladeservices/rom/atca-7367-fpga-<version>.bin
3. Upgrade the firmware image using any of the following commands:
 - **#fcu --full-upgrade -f /opt/bladeservices/rom/atca-7367-fpga-<version>.bin**
 - or
 - **#fcu --upgrade -f /opt/bladeservices/rom/atca-7367-fpga-<version>.bin**

This upgrades the user-programmable FPGA EEPROM with the specified FPGA image file.

FPGA mark operation is not supported.

4. Power-cycle the blade, if upgrade is successful.



If the blade fails to start up after an FPGA upgrade, you need to reload the FPGA EEPROM via IPMI. For information on the system boot option functionality supported by the ATCA-7367, refer *ATCA-7367 Installation and Use Guide*.

Upgrading the FPGA Firmware through Shelf manager

Procedure

Perform the following steps to upgrade the FPGA Firmware through shelf manager

1. Copy the FPGA firmware to your local machine which can access the shelf manager by IP.
2. Upgrade the FPGA.
ipmitool -I lan -H <Shelfmanager-IP-Address> -t blade's <ATCA-7367-IPMB-Address> -b 0x00 -A none hpm upgrade atca-7367-fpga-<version>.bin

3. Check the FPGA version.

```
/usr/bin/ipmitool -I lan -H <Shelfmanager-IP-Address> -t  
blade's<ATCA-7367-IPMB-Address> -b 0x00 -A none hpm  
comprop 4 2
```

4.7 Clock Agent Command Module

4.7.1 Overview

The clock agent command module provides a CLI for configuring ATCA-7367 to route and generate clock signals. It contains the following files:

- /opt/bladeservices/bin/clkcml - Contains the clock command CLI.
- /opt/bladeservices/etc/clkcml - Contains the clock configuration sample script that is based-on the clock command CLI.

The clock command CLI allows to setup most common clock configurations. If the blade acts as a line card, the clock agent implements a set of Line Card Control Block (LCCB) commands.

The clock command also provides an option to continuously check the LCCB status and reporting it in the syslog. It also allows to perform automatic clock configuration based-on AMC presence, AMC type, and logical slot position where the blade is installed.

4.7.2 clkcml

You can use the clkcml command as:

```
clkcml [-L] <command> [<arg>] [<options>]
```

The -L option is used for LCCB commands only. Refer [Table 4-5](#), for the options used by LCCB.

Table 4-4 describes the commands and options available with the `c lkc` command.

Table 4-4 Clock Commands and Options

Commands and Options	Description
-h	Displays help for the <code>c lkc</code> command.
-vh	Displays help for the <code>c lkc</code> command along with detailed examples.
-L	To run the LCCB command subset. It is required to setup and query LCCB.
-e	Enables clock buffers or specified mode/auto configuration.
-d	Disables clock buffers or specified mode/auto configuration.
-r <rc lkc>	Sets the source for the reference clock. Requires source clock to be specified using the -c option.
-s <sc lkc>	Sets the system clock to be equal to <sc lkc>.
-g	Gets the status. This option can be used along with the -c <c lkc> or -m <mode> to get the clock status (static/toggle) or the current mode setup.
-c <c lkc>	Specifies the clock to be enabled or queried.
-m <mode>	Specifies the generic mode to be enabled.
-M <conf>	Specifies the generic auto configuration mode to be activated.
-l	Lists different entities, such as clock, modes, and configuration. It requires the related entity option to be specified, such as -l -c all.
-v	Increases the verbose output level(maximum level 3).

Table 4-5 describes the commands and options available with the -L option for LCCB commands.

Table 4-5 Clock Commands and Options, for LCCB only

Commands and Options	Description
-m	Setup the LCCB operating mode.
-D	Setup the default LCCB configuration.

Table 4-5 Clock Commands and Options, for LCCB only (continued)

Commands and Options	Description
-c <clock> -f <freq>	Setup the LCCB clock output to generate frequency <freq>.
-s <sclk>	Setup the LCCB to work with system clock <sclk>.
-x	Start the status daemon.

4.7.2.1 Enable Clock Buffer

Description

This command enables the clock buffer for the specified clock id.

Synopsis

```
clkcmd -e -c <clock>
```

Parameters

You can enable the clock buffers for the following clock ids.

- CLK1A
- CLK1B
- CLK2A
- CLK2B
- CLK3A
- CLK3B
- AMC1_TCLKA
- AMC1_TCLKC

- RTM_TCLKA
- RTM_TCLKC



You cannot enable CLKxA and CLKxB at the same time, with different frequencies. CLKxA and CLKxB are intended to provide redundancy, in case of a switchover. Hence, CLKxA and CLKxB must use the same frequency.

Example

To enable the clock buffer related to clock 1A.

```
clkcmd -e -c CLK1A
```

4.7.2.2 Enable Clock Routing Mode

Description

This command enables the clock routing mode.

Synopsis

```
clkcmd [-e] -m <mode>
```

Parameters

[Table 4-6](#), describes the clock routing mode ids.

Table 4-6 Routing Mode Ids

Mode id	Description
AMC_CGM_MODE	Enables the CGM mode for the ATCA-7367 blade only.
AMC_LINECARD_MODE	Enables the line card mode (default) for the ATCA-7367 blade only.

Example

To enable the clock routing master chassis mode.

```
clkcmd -e -m AMC_CGM_MODE
```

4.7.2.3 Automatic Configuration

Description

This command enables the automatic configuration.

Synopsis

```
clkcmd -e -M <conf id>
```

Parameters

You can use AUTO_CONF_1 conf id to automatically detect the presence of the AMC, its type (CGM or not), and the slot position (left/right logical slot position). Based on this information it performs following setup:

- If AMC in the bay is CGM - set the AMC CGM mode.
 - If left AMC slot (odd slot) - enable clock buffer 1A and 2A.
 - If right AMC slot (even slot) - enable clock buffer 1B and 2B.
- If AMC in the bay is Line Card or not present - set system clock to CLK1.

4.7.2.4 LCCB Mode

Description

This command sets the SONET or SDH mode in LCCB.

Synopsis

```
clkcmd -L -m <LCCB mode id>
```

Parameters

Table 4-7, describes the LCCB mode id.

Table 4-7 LCCB Mode Ids

Mode id	Description
SDH	Setup the on-board LCCB to work in SDH mode.
SONET	Setup the on-board LCCB to work in SONET mode.

Example

To set the LCCB operating mode to SONET.

```
clkcmd -L -m SONET
```

4.7.2.5 Reference Clock Selection

Description

This command allows to select the source for the reference clocks; 3A and 3B.

Synopsis

```
clkcmd -r <ref_clock> -c <src_clock>
```

Parameters

Table 4-8, describes the combinations of the reference clock and related source setup.

Table 4-8 Reference and Source Clock Ids

Clock reference id	Clock source id	Description
CLK3A	RCVD_AMC1	Set the source for clock 3A equal to the recovered clock from AMC bay.
	RCVD_RTM	Set the source for clock 3A equal to the recovered clock from RTM.

Table 4-8 Reference and Source Clock Ids (continued)

Clock reference id	Clock source id	Description
CLK3B	RCVD_AMC1	Set the source for clock 3B equal to the recovered clock from AMC bay.
	RCVD_RTM	Set the source for clock 3B equal to the recovered clock from RTM.

Example

To set the source of reference clock 3A equal to the recovered clock from AMC bay 1.

```
clkcmd -r CLK3A -c RCVD_AMC1
```

4.7.2.6 System Clock Selection

Description

This command allows you to select the system clock; 1 or 2.

Synopsis

```
clkcmd -L -s <src_clock>
```

```
clkcmd -s <src_clock>
```

Parameters

Table 4-9, describes the identifiers that can be selected as system clock.

Table 4-9 System Clock Ids

Clock id	Description
CLK1	LCCB use CLK1 as the system clock.
CLK2	LCCB use CLK2 as the system clock.



You should run this command with and without the -L option, in order to route the system clock and configure the LCCB.

Example

To set the active system clock as CLK1.

```
clkcmd -s CLK1
```

To set the system clock on LCCB to clock 2.

```
clkcmd -L -s CLK2
```

4.7.2.7 Get Status

Description

This command provides information either about the clocks (if available) or about the LCCB settings (if -L option is used).

Synopsis

```
clkcmd [-L] -g [-c <clock>] [-m <mode>]
```

Parameters

Table 4-10, describes the options for the get status command.

Table 4-10 Options for the Get Status Command

Commands and Options	Description
No option used.	Displays the status of the clock buffer, clock signals, and current setup mode.
-L	Displays the current LCCB status. In particular this is the alarm status, currently selected source, and DPLL operating mode.
-c (without -L)	Displays the specific status of a clock.
-m current	Displays the current setup mode.

Example

To get the status for all clock signals.

```
clkcmd -g -c all
```

To get the status for all the available clock buffers, signals, and current setup mode.

```
clkcmd -g
```

4.7.2.8 List Entity

Description

This command gets the string identifiers of clocks, mode, automatic configuration, and frequencies; usually needed by clkcmd.

Synopsis

```
clkcmd -l {-c all | -m all | -M all | -f all}
```

Parameters

None.

Some of the displayed entities i.e. mode, are relevant only in the context of LCCB setup (along with the -L option).

4.7.2.9 LCCB Default Configuration

Description

This command allows you to bring LCCB to its default configuration. This configuration adapts the LCCB configuration as per the board functionality.

Synopsis

```
clkcmd -L -D
```

Parameters

None.

Example

To initialize the LCCB DPLL functionality.

```
clkcmd -L -D
```

4.7.2.10 Set LCCB Output Clock

Description

This command allows you to enable and set frequency for the available LCCB output.

Synopsis

```
clkcmd -L -c <clock> -f <freq>
```

Parameters

Table 4-11, describes the available clock ids and related frequencies.

Table 4-11 LCCB Output Clock Ids

Clock id	Available frequency	Description
AMC1	FREQ_8K, FREQ_1_544M, FREQ_2_048M, FREQ_19_44M.	Set the LCCB output connected to the AMC to the specified frequency.
RTM	FREQ_8K, FREQ_1_544M, FREQ_2_048M, FREQ_19_44M.	Set the LCCB output connected to the RTM to the specified frequency.



Frequencies can be selected depending on the configured mode. For example, FREQ_1_544M will be rejected when mode SDH is set.

Example

To activate clock output for AMC1 with 8K frequency.

```
clkcmd -L -c AMC1 -f FREQ_8K
```



It is not possible to modify the external output frequency divider factor, that is set to 1.

4.7.2.11 LCCB Status Daemon

Description

You can start `clkcmod` in a daemon mode, to continuously check the status of system clock and log status changes, such as change of DPLL operating mode and DPLL alarms. All information is logged in the `syslog`-file and is displayed on the screen. During initialization of the daemon, status information (option: `clkcmod -L -g`) is logged. After that only status changes are logged.

Synopsis

```
clkcmod -L -x
clkcmod -L -x& // To start the daemon in background.
```

Parameters

None.

Example

The following code displays a sample status daemon output.

```
// CLK1 and CLK2 not enabled
--LCCB Status Information
LCCBStatus: OperatingMode:          DPLL_FREE_RUN
LCCBStatus: SourceStatus:           SOURCE invalid
LCCBStatus: Curr. sel. Source:      NO_SOURCE_SELECTED
LCCBStatus: Alarm:                  ACTIVITY_SEC1_TTL set
LCCBStatus: Alarm:                  ACTIVITY_SEC2_TTL set

// activation of CLK1A
LCCBStatus: Alarm ACTIVITY_SEC1_TTL changed from set ---> cleared
LCCBStatus: SourceStatus: SEC1_TTL changed from invalid ---> valid
LCCBStatus: OperatingMode changed from DPLL_FREE_RUN ---> DPLL_PRELOCKED
```

```

LCCBStatus: Curr. Sel. Source changed from NO_SOURCE_SELECTED ---> SEC1_TTL
LCCBStatus: OperatingMode changed from DPLL_PRELOCKED ---> DPLL_LOCKED

// activation of CLK2A
LCCBStatus: Alarm ACTICITY_SEC2_TTL changed from set ---> cleared
LCCBStatus: SourceStatus: SEC2_TTL changed from invalid ---> valid

// deactivation of CLK1A
LCCBStatus: OperatingMode changed from DPLL_LOCKED ---> DPLL_PHASE_LOST
LCCBStatus: OperatingMode changed from DPLL_PHASE_LOST ---> DPLL_PRELOCKED2
LCCBStatus: Alarm ACTICITY_SEC1_TTL changed from cleared ---> set
LCCBStatus: SourceStatus: SEC1_TTL changed from valid ---> invalid
LCCBStatus: Curr. Sel. Source changed from SEC1_TTL ---> SEC2_TTL
LCCBStatus: OperatingMode changed from DPLL_PRELOCKED2 ---> DPLL_LOCKED

```

4.7.2.12 Verbose Output and Status Information

Description

This command is used to query the status of internal routing/LCCB registers and to get information about the current AMC bays population. It can also be used to get more information about each step performed by clkcmd.

Synopsis

```
clkcmd -v [other commands]
```

Parameters

The -v option can be used for normal status query and debug output. It can be used to print the routing register information. Along with other commands it provides first level debug output.

4.7.2.13 Example

An example for routing the clock from an AMC B1 to the backplane with ATCA-7367:

```
clkcmd -e -c CLK3A
clkcmd -r CLK3A -c RCVD_AMC1
clkcmd -e -c AMC1_TCLKA
clkcmd -e -m AMC_LINECARD_MODE
clkcmd -L -m SDH
clkcmd -L -c AMC1 -f FREQ_8K
clkcmd -L -s CLK1
clkcmd -L -s CLK2
```

4.8 HPM Agent Command Module

4.8.1 Overview

Hardware management in AdvancedTCA systems is based on the Intelligent Platform Management Interface (IPMI) specification. IPMI commands can be complex and cumbersome. To facilitate blade-level management, Artesyn provides the Hardware Platform Management (HPM) package that provides a set of commands that are based on IPMI commands but which are easier to use than the IPMI command itself. An HPM command can encapsulate a sequence of IPMI commands for example upgrade the firmware or read the FRU data. An HPM command can be the unifier for OEM IPMI commands that are different on different blade types, for example reading the CPU boot bank. For a catalogue of supported IPMI commands of the blade refer to the respective IPMI manual.

The HPM package consists of

- HPM daemon called `hpmagentd`
- Command line client called `hpmcmd`
- Script framework for managing shutdown and reboot events

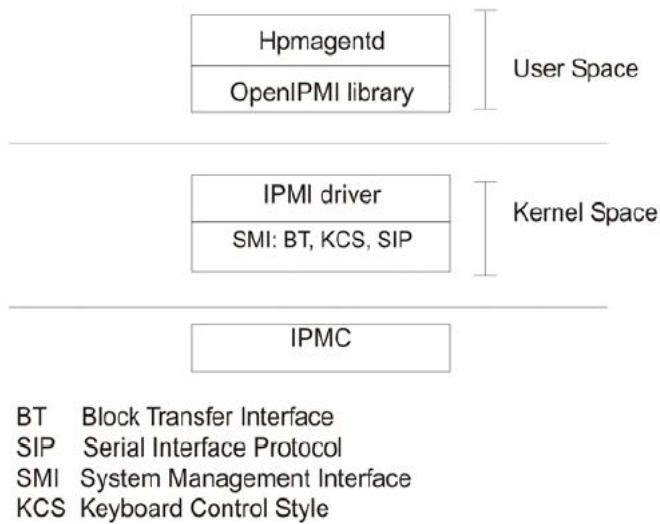
The `hpmcmd` sends a given HPM command to the `hpmagentd` and displays the received response on the console. The `hpmagentd` executes the incoming HPM commands and returns the result to a `hpmcmd` client.

HPM commands include:

- Retrieving and modifying FRU data
- Reading and controlling status of IPMI-controlled LEDs
- Executing shutdown and reboot scripts in response to cold reset or graceful reboot requests
- Communicating local slot location information

The `hpmagentd` makes use of OpenIPMI to talk to the local IPMC. OpenIPMI consists of two main parts: A device driver that goes into the Linux kernel, and a user-level library. The following picture shows the software levels that are involved in the HPM architecture:

Figure 4-1 Software Levels of the HPM Architecture



The SMI (System Management Interface) driver provides the low level interface for talking to the IPMC and could be a KCS driver or BT (block transfer driver) or other.

If you need more information about the software aspects of the blade IPM controller, refer to the respective IPMI manual.

4.8.2 hpmagentd—HPM Agent Daemon

Description

The HPM agent daemon handles local communication to the intelligent platform management controller (IPMC) on a blade using the SMI. This SMI gets set up by the OpenIPMI driver.

By default, the `hpmagentd` binary executable is installed in `/opt/bladervices/bin/`. This directory has been added to the `PATH` environment variable.

This daemon has an init script called `hpm` that will start the daemon in run level 2 with the default settings.

When `hpmagentd` receives a graceful reboot or shutdown alert from the IPMC, it will call the respective script to run the reboot or shutdown sequence.

Synopsis

```
hpmagentd [-l log-level] [-r reboot-script] [-s shutdown-script]
hpmagentd {-i | -u | -h | -v}
```

Parameters

`-l log-level`

Specifies the level of message logging, where `log-level` is one of the standard syslog levels:

Log Level	Description
0	Emergency
1	Alert
2	Critical
3	Error
4	Warning
5	Notice (default)
6	Information
7	Debug

`-r reboot-script`

Specifies a graceful reboot script that will be called when a blade graceful reboot request is received by the IPMC, where `reboot-script` is the complete path and filename of the target script. The default is `/opt/bladervices/bin/hpmreboot` (see [hpm—Shutdown and Reboot Scripts on page 135](#)).

`-s shutdown-script`

Specifies a shutdown script that will be called when a blade shutdown request is received by the IPMC, where shutdown-script is the complete path and filename of the target script. The default is `/opt/bladeservices/bin/hpmshutdown` (see [hpm—Shutdown and Reboot Scripts on page 135](#)).

`-i`

hpmagentd runs interactively, that is it will not run as daemon.

`-u | -h`

Displays a brief message about command usage.

`-v`

Displays the version of hpmagentd and the version of the OpenIPMI library it is linked against.

4.8.3 hpm—Start-Up Script

Description

An HPM agent init script, `hpm`, allows you to start, stop, and restart the HPM agent daemon using the agent's default option settings. By default, this script is installed in the `/opt/bladeservices/etc/init.d` directory during installation of the BBS software. It is also linked to `/etc/rc.d/rcS.d` to automatically start the HPM agent when the system boots.

Synopsis

```
hpm {start | stop | restart | reload}
```

Parameters

start

Starts the hpm agent daemon.

stop

Terminates the hpm agent daemon.

restart

Terminates and then starts the hpm agent daemon.

reload

Terminates and then starts the hpm agent daemon.

4.8.4 hpm—Shutdown and Reboot Scripts

Description

At any time during normal operation, a shelf manager may issue a shutdown (FRU Activation Deactivate) or graceful reboot (FRU Control Reboot) request to the IPMC on a given blade. The IPMC then forwards this information to the HPM agent. The HPM agent listens for such requests from the IPMC. When it receives a request, it calls the respective script to run the reboot or shutdown sequence. In case of a shutdown indication, all running processes should be notified about the shutdown. In case of a reboot notification, the payload is responsible for invoking the reboot procedure. The IPMC is not involved in this process. This allows processes currently running on the blade to prepare for shutdown. After the notification, it takes roughly 30 seconds before the payload is powered off.

Two default scripts, `hpmshutdown` and `hpmreboot`, are installed by default in the `/opt/bladeservices/bin` directory. Currently, these scripts simply print a banner indicating they have run and then issue `shutdown -h now` (`hpmshutdown` script) or `reboot` (`hpmreboot` script).

You may modify the default scripts to suit the needs of your system application or create new scripts. If you create new scripts, use the `-s` and `-r` options when starting `hpmagentd` to specify the new locations and names of the scripts. You may also need to update the `hpm start up` script in `/opt/bladeservices/etc/init.d/hpm`.

Synopsis

`hpmshutdown`

`hpmreboot`

4.8.5 hpmcmd—HPM Command Utility

Description

The HPM command utility uses a socket to send commands to the HPM agent. The HPM agent takes care of translating the user-friendly commands into the elaborated IPMI commands that the IPMC is able to understand. Those IPMI commands are transferred to the local IPMC.

Only one HPM command can be outstanding with the HPM agent at any particular moment. This means that even though multiple instances of `hpmcmd` can be started, the HPM agent will handle only one command at a time. Once a command is sent, the `hpmcmd` program waits until the answer from the HPM agent is received or until a time-out occurs.

The HPM command utility can be started in interactive mode, where a prompt is displayed and the user enters commands; it can read in a file of commands; or it can process a single command.

By default, the `hpmcmd` binary executable is installed in `/opt/bladervices/bin`. During installation of the BBS software, this directory is added to the `PATH` environment variable.

If you do not provide any options you will see the following prompt once the program starts running:
`hpmcmd>`

From there you can start executing commands.

Synopsis

```
hpmcmd [-p new-prompt] [-o output] [-i input | -c command]
hpmcmd [--prompt new_prompt] [--output_file output] [--input_file
input | -cmd_line command]
```

Parameters

`-p new-prompt`

Specifies the prompt you would like to have for the `hpmcmd` interactive mode, where `new-prompt` is any string. The default prompt is `hpmcmd>`. This option should not be combined with the `-r` or `-c` options.

-i input-file

Specifies the name of a file with HPM commands, where input-file is the complete path and filename of the target file, a standard ASCII file with one command per line (comments are not supported). The default is Standard Input (stdin). This option should not be combined with the -c option.

Once it has executed all commands in the file, hpmcmd terminates.

-o output-file

Specifies the name of an output file, where output-file is the complete path and filename of the target file. The default is Standard Output (stdout).

-c command

This option executes a single command and terminates, where command is one of the supported commands. This allows you to use the arrow history functions supported in the base shell; a history is not available inside the hpmcmd program. This option should not be combined with the -i option.

If this option is combined with -o, -c should be last option entered, since all arguments that follow -c on the command line will be considered part of the command.

4.8.5.1 Command Overview

The following table lists all commands from the hpmcmd program available on the ATCA-7367. You can display this list and a short command description using the help command (see section [help on page 151](#)). A detailed description of the commands is given in section [Supported Commands on page 139](#).

Table 4-12 Command Overview

Command	Description
bootbankget	Gets the bootbank to boot from
bootbankset	Sets the bootbank to boot from
bootparamerase	Erase boot parameter value
bootparamget	Get boot parameter value
bootparamset	Set a boot parameter value

Table 4-12 Command Overview (continued)

Command	Description
<i>bye</i>	Exit the hpmCmd program
<i>chinfo</i>	Retrieve channel info
<i>cmd</i>	Execute any IPMI command
<i>deviceid</i>	Gets the Device Id.
<i>exit</i>	Exit the hpmcmd program
<i>frudata</i>	Allows to get FRU info in hex numbers
<i>fruinfoget</i>	Gets string fields from the FRU
<i>fruinv</i>	Allows to get the FRU size and addressable units
<i>fruread</i>	Allows to read x number of bytes from the FRU
<i>fruwrite</i>	Allows to write x number of bytes from the FRU
<i>help</i>	List of hpmcmd commands.
<i>ipmbaddress</i>	Shows the local board IPMB address
<i>ipmcdevice</i>	Shows the payload interface to the IPMC
<i>ipmcstatus</i>	Gets the IPMC Status
<i>ledget</i>	Gets the state of a specific FRU LED
<i>ledprop</i>	Get the LED properties for this FRU.
<i>ledset</i>	Controls the state of a specific FRU LED
<i>loglevelget</i>	Gets the hpmagentd log level
<i>loglevelset</i>	Sets the hpmagentd log level(0-7)
<i>macaddress</i>	Lists the MAC addresses
<i>motshelftype</i>	Gets the Artesyn Shelf Type from the Shelf FRU (Board Product Name)
<i>partnumber</i>	Gets the board part number
<i>physlotnumber</i>	Gets the board physical slot number
<i>portget</i>	Shows the current state E-Key governed intfs
<i>portset</i>	Enables/Disables ports in a channel
<i>quit</i>	Exit the hpmcmd program

Table 4-12 Command Overview (continued)

Command	Description
<i>rebootpath</i>	Gets hpmagentd reboot script path
<i>sdr</i>	Shows the SDR records
<i>sdr_dump</i>	Shows the SDR records in raw format
<i>sdrinfo</i>	Shows SDR information
<i>sendcmd</i>	Sends an IPMI command
<i>shelfaddress</i>	Gets the Shelf Address String
<i>shelfslots</i>	Gets number of slots in the shelf
<i>shutdownpath</i>	Gets hpmagentd shutdown script path
<i>slotmap</i>	Prints the slotmap of the shelf
<i>slotnumber</i>	Shows the board logical slot number
<i>solcfgget</i>	Get SOL configuration parameter
<i>solcfgset</i>	Set SOL configuration parameter
<i>upgrade</i>	Allows to upgrade the IPMC firmware
<i>version</i>	Shows the hpmCmd version and the hpmagentd version
<i>watchdog</i>	Control Payload WDT functionality

4.8.5.2 Supported Commands

This section lists the supported commands. All commands are case insensitive. The examples illustrate the use of hpmcmd in single-command mode (- c). If you start hpmcmd without the - c or - i options (that is, interactive mode), you simply enter these commands at the HPM command prompt.

Some of the hpm commands can be sent to a remote IPMC by specifying the - t option. This option is not mandatory. If it is not specified, the command is sent to the local IPMC.

4.8.5.2.1 bye

Description

This command is for exiting the hpmcmd program when running in interactive mode.

Synopsis

bye

4.8.5.2.2 bootbankget

Description

This command retrieves the boot bank which is currently marked as active for the CPU specified by `payload_cpu_selector`.

Firmware for the CPU on Artesyn AdvancedTCA blades is stored in redundant, persistent memory devices. This allows the firmware image in one bank to serve as a backup for the other bank. During normal operation, the CPU on a blade determines which bank to boot from based on a GPIO signal controlled by the IPMC. This bank is considered the active boot device.

Because you can change the “active” device with the `hpmcmd bootbankset` command, active status does not necessarily indicate which device was used on the last boot. It simply represents which device is set to be used on the next boot.

Synopsis

```
bootbankget <payload_cpu_selector>
```

Parameters

`payload_cpu_selector`

Is an integer between 0 and the number of CPU devices supported on the blade.

Example

```
hpmcmd -c bootbankget 0
```

4.8.5.2.3 bootbankset

Description

This command sets the boot bank for a particular CPU from which the blade is supposed to boot.

Synopsis

```
bootbankset <payload_cpu_selector> <newBootBank>
```

Parameters

payload_cpu_selector

Is an integer between 0 and the number of CPU devices supported on the blade.

newBootBank

Can be set to BANK0 or BANK1

Example

```
hpmcmd -c bootbankset 0 bank1
```

4.8.5.2.4 bootparamerase

Description

This command allows you to erase data which is stored in the IPMC boot parameters storage area. The data which is stored in this area can be accessed from the IPMI subsystem and also from the OS and boot firmware. The storage area can for example be used in order to pass boot parameters to the boot firmware. For further details, refer to the *ATCA-7367 Installation and Use Guide*.

Synopsis

```
bootparamget section name [-t ipmbAddr[:mmcAddr]]
```

Parameters

section

Section within the IPMC storage area in which data is to be erased. Possible values are:

- USER
- DEFAULT
- TEST
- OS_PARAM

name

Name of the parameter which is to be erased

-t

Sends the command to ipmbAddr:mmcAddr. The ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c bootparamerase USER boot_order
```

Successful bootparamerase Operation

4.8.5.2.5 bootparamget

Description

This command allows you to read data which is stored in the IPMC boot parameters storage area. The data which is stored in this area can be accessed from the IPMI subsystem and also from the OS and boot firmware. The storage area can for example be used in order to pass boot parameters to the boot firmware. For further details, refer to the *ATCA-7367 Installation and Use Guide*.

Synopsis

```
bootparamget section [name] [-t ipmbAddr[:mmcAddr]]
```

Parameters

section

Section within the IPMC storage area from which data is to be read. Possible values are:

- USER
- DEFAULT
- TEST
- OS_PARAM

name

Name of the parameter whose value is to be read

-t

Sends the command to ipmbAddr:mmcAddr. The ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c bootparamget USER boot_order
```

```
boot_order = sashdd,sata3,sata1,basenet0,basenet1
```

4.8.5.2.6 bootparamset

Description

This command allows you to write data to the IPMC boot parameters storage area. The data which is stored in this area can be accessed from the IPMI subsystem and also from the OS and boot firmware. The storage area can for example be used in order to pass boot parameters to the boot firmware. For further details, refer to the *ATCA-7367 Installation and Use Guide*.

Synopsis

```
bootparamset section name=value [-t ipmbAddr[:mmcAddr]]
```

Parameters

section

Section within the IPMC storage area where to write the data to. Possible values are:

- USER
- DEFAULT
- TEST
- OS_PARAM

name

Name of the parameter which is to be set

value

Value of the parameter

-t

Sends the command to ipmbAddr:mmcAddr. The ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c bootparamset USER  
bootboot_order=sashdd,sata3,sata1,basenet0,basenet1,usb onboard  
Successful bootparamset Operation
```

4.8.5.2.7 chinfo

Description

Retrieve channel information

Synopsis

```
chinfo channel [-t ipmbAddr[:mmcAddr]]
```

Parameters

channel

Channel number

-t

Sends the command to ipmbAddr:mmcAddr. The ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c chinfo 0
```

```

Channel Medium Type   : IPMB (I2C)
Channel Protocol Type : IPMB-1.0
Session Support       : session-less
Active Session Count  : 0
Protocol Vendor ID    : 001BF2

```

```

root@ATCA7367_HDD:~# hpmcmd -c chinfo 4
Channel Medium Type   : System Interface (KCS, SMIC, or BT)
Channel Protocol Type : KCS
Session Support       : session-less
Active Session Count  : 0
Protocol Vendor ID    : 001BF2

```

```

root@ATCA7367_HDD:~# hpmcmd -c chinfo 1
Channel Medium Type   : Asynch. Serial/Modem (RS-232)
Channel Protocol Type : TMode
Session Support       : session-less
Active Session Count  : 0
Protocol Vendor ID    : 00400A

```

4.8.5.2.8 cmd

Description

This command allows you to enter commands understood by the IPMC. Commands are entered as a sequence of hexadecimal numbers as defined in the *IPMI 1.5 Specification*.

Synopsis

```
cmd <ipmi address> <netfn cmd> <cmd data>
```

Parameters

ipmi address

The IPMI address specifies the IPMC that receives the command, it can be the local IPMC or another IPMC on the IPMB. The IPMI address for the local IPMC consists of <f LUN> where f is the BMC channel number. The IPMI address for a remote IPMC consists of <0 SA LUN>.

netfn cmd

Identifies the command type.

`cmd data`

Specifies the message data associated with the command.

Example

GetDeviceId command to the local IPMC:

```
hpmcmd -c cmd f 0 6 1
```

GetDeviceId command to the remote IPMC on address 9a:

```
hpmcmd -c cmd 0 9a 0 6 1
```

GetDeviceId command to the remote IPMC on address 7a:

```
hpmcmd -c cmd 0 7a 0 6 1
```

4.8.5.2.9 deviceid

Description

This command retrieves the raw IPMI Get Device ID response and decodes the IPMI message.

Synopsis

```
deviceid -t [ipmbAddr[:mmcAddr]]
```

Parameters

-t

Sends the command to ipmbAddr:mmcAddr. ipmbAddr is the string lc if it is a local mmcAddr.

Example

hpmcmd -c deviceid



The least significant byte of the Auxiliary Revision indicates the build number inside the release.

4.8.5.2.10 exit

Description

This command is for exiting the hpmcmd program when running in interactive mode.

Synopsis

`exit`

4.8.5.2.11 frudata

Description

This command dumps the content of the FRU data in hexadecimal format.

Synopsis

`frudata <fruid> [-t ipmbAddr[:mmcAddr]]`

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module.

-t

Sends the command to ipmbAddr:mmcAddr. ipmbAddr is the string lc if it is a local mmcAddr.

Example

hpmcmd -c frudata 0

4.8.5.2.12 fruinfoget

Description

This command retrieves information from the specified FRU.

Synopsis

```
fruinfoget <fruid> [field] [-v] [-t ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module.

field

Is one of the following data fields. If no field is specified, it retrieves the whole fruinfo for that FRU.

Field	Description
bmanufacturer	Board manufacturer
bproductname	Board product name
bserialnumber	Board serial number
bpartnumber	Board part number
pmanufacturer	Product manufacturer
pproductname	Product product name
ppartnumber	Product part number
pversion	Product version number
pserialnumber	Product serial number
passettag	Product inventory asset identifier

-v

Verbose mode to get point-to-point connectivity information where no specific field is requested.

-t

Sends the command to ipmbAddr:mmcAddr . ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c fruinfoget 1 bmanufacturer
```

The following example for fruinfoget is without fields and -v option.

```
hpmcmd -c fruinfoget 0
```

4.8.5.2.13 fruinv

Description

This command retrieves the FRU size and the addressable unit for the specified FRU.

Synopsis

```
fruinv <fruid> [-t ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module (if supported).

-t

Sends the command to ipmbAddr:mmcAddr . ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c fruinv 0
```

4.8.5.2.14 fruread

Description

This command gets a range of data from the specified FRU.

Synopsis

```
fruread <fruid> <startAddress> <nBytes> [-t ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module (if supported).

startAddress

Is the starting address in decimal.

nbytes

Number of bytes to read in decimal; cannot exceed 16 because of IPMI message size limitations.

Example

```
hpmcmd -c fruread 0 0 8
```

4.8.5.2.15 fruwrite

Description

This command allows to write x number of bytes to a FRU.

Synopsis

```
fruwrite <fruid> <startAddress> <nBytes> [-t ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade.

startAddress

Starting address in decimal numbers.

nBytes

is the number of bytes to write in decimal. nBytes cannot exceed 16 because of IPMI message size limitations.

4.8.5.2.16 help

Description

This command lists the available commands from the hpmcmd program with a brief explanation about the command.

Synopsis

```
he lp
```

4.8.5.2.17 ipmbaddress

Description

This command retrieves the blade IPMB address.

Synopsis

```
ipmbaddress
```

4.8.5.2.18 ipmcdevice

Description

This command retrieves the payload tty device.

Synopsis

```
ipmcdevice
```

4.8.5.2.19 ipmcstatus

Description

This command retrieves the IPMC operating mode, payload control and outstanding events.

Synopsis

```
ipmcstatus [-v] [-t ipmbAddr]
```

Parameters

-v

Verbose mode to get additional information operation

Example

```
hpmcmd -c ipmcstatus -v
```

4.8.5.2.20 ledget

Description

This command gets information about a specified LED controlled by the IPMC.

Synopsis

```
ledget <fruid> <led> [-t ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module (if supported).

led

Is BLUE for the hot swap LED or LEDN for FRU LED<n>. <n> is a number between 1 and the maximum FRU LEDs supported by the blade.

-t

Sends the command to ipmbAddr:mmcAddr. ipmbAddr is the string lc if it is a local mmcAddr.

Example

```
hpmcmd -c ledget 0 led1
```

4.8.5.2.21 ledprop

Description

This command displays the FRU LED properties under IPMC control.

Synopsis

```
ledprop <fruid>
```

Parameters

fruid

0 for the main board and 1 for the RTM.

Example

```
hpmcmd -c ledprop 0
```

FRU LEDs under IPMC control:

LED0 = BLUE

LED1 = RED or AMBER

LED2 = GREEN

4.8.5.2.22 ledset

Description

This command controls the override state of a specific FRU LED. The RTM FRU LEDs reflect the state of the main blade (FRU 0) LEDs. Therefore, overriding the state to something different than the main FRU LED state will not have any effect.

The blue LED is the only one that can be controlled separately.

Synopsis

```
ledset <fruid> <led> <operation> [offms] [onms] [color] [-t  
ipmbAddr[:mmcAddr]]
```

Parameters

fruid

Is 0 for the main blade and 1 for the rear transition module (if supported).

led

Is BLUE for the hot swap LED or LEDN for FRU LED<n>. <n> is a number between 1 and the maximum FRU LEDs supported by the blade

operation

ON = enable override state and turn LED on.

OFF = enable override state and turn LED off.

BLINK = enable override state and blink LED; off_duration and on_duration specify the blink duration; the default on and off duration is 300 ms.

LOCAL = cancel override state and restore LED control to the IPMC, that is, local state.

TEST = run lamp test for specified on_duration, then restore prior state.

offms

10–2500 in 10-millisecond increments; only valid if operation is BLINK

onms

Only valid if operation is BLINK or TEST:

If operation is BLINK, 10–2500 in 10-millisecond increments

If operation is TEST, 100–12800 in 100-millisecond increments

color

LED0 = BLUE

LED1 = RED

LED2 = GREEN

LED3 = AMBER

-t ipmbAddr

Sends the command to ipmbAddr.

Example

```
hpmcmd -c ledset 0 led1 on
```

4.8.5.2.23 loglevelget

Description

This command retrieves the current `hpmagentd` log level. See `loglevelset` for more detail.

Synopsis

```
loglevelget
```

Example

```
hpmcmd -c loglevelget
```

```
LogLevel 5 (NOTICE)
```

4.8.5.2.24 loglevelset

Description

This command sets the level of message logging for `hpmagentd`.

Synopsis

```
loglevelset <newLogLevel>
```

Parameters

`newLogLevel`

Is one of the standard syslog levels:

Level	Description
0	Emergency
1	Alert
2	Critical
3	Error

Level	Description
4	Warning
5	Notice
6	Information
7	Debug

Example

```
hpmcmd -c loglevelset 7
```

4.8.5.2.25 macaddress

Description

This command retrieves a list of available MAC addresses.

Synopsis

```
macaddress [-t ipmbAddr]
```

Parameters

-t ipmbAddr

Sends the command to ipmbAddr.

Example

```
hpmcmd -c macaddress  
BASE Interface Channel 0 : 00:0E:0C:85:E9:91  
  
BASE Interface Channel 1 : 00:0E:0C:85:E9:90
```

4.8.5.2.26 motshelftype

Description

This command retrieves the shelf FRU (IPMB 20) Board Area Product Name (FRU 254).

Synopsis

`motshelftype`

Example

```
hpmcmd -c motshelftype  
CHS1406
```

4.8.5.2.27 **partnumber**

Description

This command retrieves the part number of the main blade.

Synopsis

```
partnumber [-t ipmbAddr[:mmcAddr]]
```

Parameters

-t ipmbAddr

Sends the command to ipmbAddr.

Example

```
hpmcmd -c partnumber
```

4.8.5.2.28 **physlotnumber**

Description

This command retrieves the physical slot number in which the blade is plugged in.

Synopsis

```
physlotnumber
```

4.8.5.2.29 **portget**

Description

This command shows the current state of interfaces governed by e-keying. If no channel is specified, portget returns data for all channels in the specified interface. If neither interface nor channel are specified, portget will return data for all interfaces.

Synopsis

```
portget [interface] [channel] [-t ipmbAddr[:mmcAddr]]
```

Parameters

interface

Valid values are:

BASE | FABRIC | UPDATE

channel

an integer in the following range:

1–16 for Base

1–15 for Fabric

1 for Update

The value of channel must be valid for the blade. For example, node blades have only 2 channels for the base interface; using a value of 4 will return an error.

-t ipmbAddr

Sends the command to ipmbAddr.

Example

```
hpmcmd -c portget AMC 0
```

4.8.5.2.30 portset

Description

This command enables and disables ports in a channel. The following table lists the valid values for each parameter.

Synopsis

```
portset <intf> <chan> <grpId> <type> <typeX> <ports> <oper> [-t  
ipmbAddr[:mmcAddr]]
```

Parameters

intf

Valid values are:
BASE | FABRIC | UPDATE

chan

an integer in the following range:
1–16 for Base
1–15 for Fabric
1 for Update
The value of channel must be valid for the blade. For example, node blades have only 2 channels for the base interface; using a value of 4 will return an error.

grpId

Always 0 according to current shelf FRU information

type

Valid values are:

Valid Value	Description
BASE	for base interface
ETHER	for fabric interface
OEM	for the update interface, which is Artesyn specific

typeX

Always 0 in current implementation. Valid values are:
0 (for 1000Base-BX)
1 (for 10GBase-BX4)
2 (for FC-PI)

ports

A sequence of ports to act on.

For base and update channels, port is always 0.

For fabric channels, port can specify up to 4 ports as specified in PICMG 3.1:

Option 1: 0

Option 2: 01

Option 9: 0123

oper

Valid values are DISABLE or ENABLE.

Example

```
hpmcmd -c portset base 1 0 base 0 0 enable
```

4.8.5.2.31 quit

Description

This command is for exiting the hpmcmd program when running in interactive mode.

Synopsis

```
quit
```

4.8.5.2.32 rebootpath

Description

This command retrieves the path and filename of the current hpmagentd reboot script.

Synopsis

```
rebootpath
```

Example

```
hpmcmd -c rebootpath  
/opt/bladervices/bin/hpmreboot
```

4.8.5.2.33 sdr

Description

This command shows the SDR records.

Synopsis

sdr

Example

hpmcmd -c sdr

```
recID 0: management controller device locator record
  I2C slave addr: 42
  Channel number: 00
  Power state: 06
  Global init: 0C
  Capabilities: 2D
  Entity Id: PICMG front board
  Entity instance: 60
  OEM: 00
  Id string: ATCA-7367

recID 1: full sensor record
  owner is IPMB 84 sensor num 00 on lun 00 channel 00
  logical entity: PICMG front board - instance 60
  Hot Swap Carrier : FRU hot swap : sensor-specific discrete

recID 2: full sensor record
  owner is IPMB 84 sensor num 01 on lun 00 channel 00
  logical entity: AMC - instance 65
  Hotswap_AMC1 : FRU hot swap : sensor-specific discrete
```

4.8.5.2.34 sdr_dump

Description

This command shows the SDR records in binary and hex format.

Synopsis

sdr_dump

Example

```
hpmcmd -c sdr_dump
```

```
SDR Records: 01 00 51 12 14 94 00 cc 2d 00 00 00 a0 60 00 c9
"..Q....i-..._`.é" 41 54 43 41 2d 37 33 36 37 "ATCA-7367"
```

4.8.5.2.35 sendcmd

Description

This command allows a user to send any of the commands supported in the IPMI spec to a remote IPMC.

Synopsis

```
sendcmd <IPMBAddress> <netfn> <cmd> <data0> ... <dataN>
```

Parameters

IPMBAddress

Destination IPMB address in hex digits.

netfn

IPMI request net function in hex digits.

cmd

IPMI request command in hex digits

data0 ... dataN

IPMI request data bytes. if any, in hex digits.

Example

```
hpmcmd -c sendcmd 90 06 59
```

```
07 59 C1
```

4.8.5.2.36 sdrinfo

Description

This command shows the SDR information.

Synopsis

```
sdrinfo
```

Example

```
hpmcmd -c sdrinfo
```

```
SDR Information:
```

```
LUN 0 has 062 sensors; static sensor population
```

```
LUN 1 has 000 sensors
```

```
LUN 2 has 000 sensors
```

```
LUN 3 has 000 sensors
```

4.8.5.2.37 shelfaddress

Description

This command retrieves the shelf address string from the shelf FRU.

Synopsis

```
shelfaddress
```

Example

```
hpmcmd -c shelfaddress  
01
```

4.8.5.2.38 shelfslots

Description

This command retrieves the total number of blade slots in the shelf.

Synopsis

```
shelfslots
```

Example

```
hpmcmd -c shelfslots
```

```
2 slots      //e.g. in a Centellis 2000 System
```

4.8.5.2.39 shutdownpath

Description

This command retrieves the path and filename of the current `hpmagentd` shutdown script.

Synopsis

```
shutdownpath
```

Example

```
hpmcmd -c shutdownpath
```

```
/opt/bladervices/bin/hpmshutdown
```

4.8.5.2.40 slotmap

Description

This command prints a slotmap table for the shelf the blade is installed in.

Synopsis

```
slotmap
```

Example

```
hpmcmd -c slotmap
```

```
Physical Slot : 01 02 03 04 . 05 06 07 08 . 09 10 11 12 . 13 14
```

```
Logical Slot : 13 11 09 07 . 05 01 03 04 . 02 06 08 10 . 12 14
```

```
IPMB Address : 9A 96 92 8E . 8A 82 86 88 . 84 8C 90 94 . 98 9C
```

4.8.5.2.41 slotnumber

Description

This command retrieves the logical slot number of the slot where the blade is plugged in.

Synopsis

`slotnumber`

Example

```
hpmcmd -c slotnumber  
2
```

4.8.5.2.42 solcfgget

Description

Retrieves the current serial over LAN (SOL) configuration. SOL is a feature which allows you to redirect the serial console of the blade via an IPMI session over the network. Refer to the blade's hardware user manual for further details.

Synopsis

```
solcfgget channel [param] [-t ipmbAddr[:mmcAddr]]
```

Parameters

`channel`

Channel number

`param`

The configuration parameter whose value you want to retrieve. Possible values are:

- `enable`
- `authentication`
- `char-settings`
- `retry`

- nonvolatile-bit-rate
- volatile-bit-rate
- payload-channel
- payload-port

-t

Sends the command to ipmbAddr:mmcAddr . ipmbAddr is the string lc if it is a local mmcAddr.

4.8.5.2.43 solcfgset

Description

Sets a serial over LAN (SOL) configuration parameter. SOL is a feature which allows you to redirect the serial console of the blade via an IPMI session over the network. Refer to the blade's hardware user manual for further details.

Synopsis

```
solcfgset channel param value [-t ipmbAddr[:mmcAddr]]
```

Parameters

channel

Channel number

param

The configuration parameter whose value you want to retrieve. Possible values are:

- enable
- authentication
- char-settings
- retry
- nonvolatile-bit-rate
- volatile-bit-rate

- payload-channel
- payload-port

value

The value which you want to set

-t

Sends the command to ipmbAddr:mmcAddr . ipmbAddr is the string lc if it is a local mmcAddr.

4.8.5.2.44 upgrade

Description

This command is used to upgrade the IPMC firmware.

It is only possible to upgrade the firmware remotely from one blade to another, not from the blade itself. In case of an RTM upgrade the front blade will be powered down.

Synopsis

```
upgrade <image> -f <filepath>
```

Parameters

image

Full path of the upgrade image file

-f filepath

Full path of the upgrade image file. This operation will make the current image the backup one.

4.8.5.2.45 version

Description

This command retrieves the version of the hpmcmd software and sends a request to get the version of the hpmagent daemon that is running. Once the information is gathered, it is printed.

Synopsis

version

Example

hpmcmd -c version

hpmcmd version bbs 3.1.0 build X

hpmagentd version bbs 3.1.0 build X

4.8.5.2.46 watchdog

Description

This command is used handle the payload BMC watchdog.

Synopsis

watchdog set <tmr_use> <tmr_action> <pre_timeout> <flags> <lsb_val>
<msb_val>

watchdog set default

watchdog get

watchdog start

watchdog stop

watchdog reset

Parameters

set

Possible values are

tmr_use	dont_stop stop
tmr_action	no_action hard_reset power_cycle power_down
pre_timeout	0-255
flags	clear dont_clear
lsb_val	0-255
msb_val	0-255

Related Documentation

A.1 Artesyn Embedded Technologies - Embedded Computing Documentation

The publications listed below are referenced in this manual. You can obtain electronic copies of Artesyn Embedded Technologies - Embedded Computing publications by contacting your local Artesyn sales office. For released products, you can also visit our Web site for the latest copies of our product documentation.

1. Go to www.artesyn.com/computing.
2. Under SUPPORT, click **TECHNICAL DOCUMENTATION**.
3. Under FILTER OPTIONS, click the Document types drop-down list box to select the type of document you are looking for.
4. In the **Search** text box, type the product name and click GO.

Table A-1 Artesyn Embedded Technologies - Embedded Computing Publications

Document Title	Publication Number
ATCA-7367 Installation and Use Guide	6806800K72
RTM-ATCA-7360 Installation and Use Guide	6806800J08

A.2 Related Specifications

For additional information, refer to the following table for related specifications. As an additional help, a source for the listed document is provided. Please note that, while these sources have been verified, the information is subject to change without notice.

Table A-2 Related Specifications

Document Title	Source
IPMI Specifications http://www.intel.com/design/servers/ipmi	
IPMI Spec V.2.0	Intel Corporation, Hewlett-Packard, DEC, NEC
IPMI Platform Management FRU Information Storage Definition V1.0, September 27, 1999	Intel Corporation
PCI Industrial Computer Manufacturers Group (PICMG) Specifications http://www.picmg.org	
PICMG 3.0 Revision 2.0 Advanced Telecommunications Computing Architecture (AdvancedTCA) Base Specification	PICMG

A.3 Additional Resources

The following table lists additional resources which may be useful in working with Artesyn's AdvancedTCA systems.

Table A-3 Additional Resources

Resource	Source
OpenHPI open source software project http://openhpi.org	
OpenHPI 1.0 Manual	OpenHPI
OpenHPI NetSNMP Subagent Development Manual	OpenHPI
Net-SNMP http://net-snmp.sourceforge.net/	

Table A-3 Additional Resources (continued)

Resource	Source
Pigeon Point Systems http://www.pigeonpoint.com	
IPM Sentry Shelf-External Interface Reference	Pigeon Point Systems
IPM Sentry Shelf Manager User Guide	Pigeon Point Systems
OpenIPMI http://openipmi.sourceforge.net/	
RHEL Installation Guide http://www.redhat.com/docs/manuals/enterprise/RHEL-5-manual/Installation_Guide-en-US/index.html	
RHEL Virtualization Guide http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5.4/html/Virtualization_Guide/index.html	
ATCA Wikipedia http://en.wikipedia.org/wiki/Advanced_Telecommunications_Computing_Architecture	
Virtual Network Computing Wikipedia http://en.wikipedia.org/wiki/Vnc	
Dynamic Host Configuration Protocol (DHCP) http://www.dhcp.org/	



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